SUEZ Water Delaware Inc.
PSC Docket No. _____
Witness: Pauline M. Ahern

BEFORE THE

DELAWARE PUBLIC SERVICE COMMISSION

PREPARED TESTIMONY

OF

PAULINE M. AHERN, CRRA
PARTNER
SUSSEX ECONOMIC ADVISORS, LLC

ON BEHALF OF

SUEZ WATER DELAWARE INC.

FEBRUARY 5, 2016

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INTRODUCTION

Q. PLEASE STATE YOUR NAME, OCCUPATION AND BUSINESS ADDRESS.

A. My name is Pauline M. Ahern. I am a Partner with Sussex Economic Advisors, LLC. My business address is 1900 West Park Road, Suite 250, Westborough, MA 01581. My mailing address is 3000 Atrium Way, Suite 241, Mount Laurel, NJ 08054.

Q. PLEASE SUMMARIZE YOUR PROFESSIONAL EXPERIENCE AND EDUCATIONAL BACKGROUND.

A. I have offered expert testimony on behalf of investor-owned utilities before twenty-nine state regulatory commissions in the United States as well as one provincial regulatory commission in Canada on rate of return issues, including but not limited to common equity cost rate, fair rate of return, capital structure issues, relative investment risk and credit quality issues. I am a graduate of Clark University where I was awarded a Bachelor of Arts degree with honors in Economics. I was also awarded a Master of Business Administration with high honors and a concentration in finance by Rutgers University.

On behalf of the American Gas Association ("A.G.A."), I calculate the A.G.A. Gas Index, which serves as the benchmark against which the performance of the American Gas Index Fund ("AGIF") is measured monthly. The A.G.A. Gas Index and AGIF are a market capitalization weighted index and mutual fund, respectively, comprised of the common stocks of the publicly traded corporate members of the A.G.A.

I am a member of the Society of Utility and Regulatory Financial Analysts

("SURFA") where I serve on its Board of Directors, having served two terms as President, from 2006 – 2008 and 2008 – 2010. Previously, I held the position of Secretary/Treasurer from 2004 – 2006. In 1992, I was awarded the professional designation "Certified Rate of Return Analyst" ("CRRA") by SURFA, which is based upon education, experience and the successful completion of a comprehensive written examination.

I am also an associate member of the National Association of Water Companies, serving on its Finance/Accounting/Taxation and Rates and Regulation Committees; a member of the Advisory Council of the Financial Research Institute – University of Missouri – Robert J. Trulaske, Sr. College of Business; a member of the American Finance and Financial Management Associations; and, a member of A.G.A.'s State Affairs Committee.

PURPOSE

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. The purpose of my direct testimony is to provide testimony on behalf of SUEZ Water Delaware Inc. ("SWDE" or "the Company") relative to the appropriate overall rate of return, including capital structure ratios, long-term debt cost rate and the investor-required common equity cost rate which SWDE should be afforded the opportunity to earn on its jurisdictional rate base.

Q. HAVE YOU PREPARED AN EXHIBIT WHICH SUPPORTS YOUR RECOMMENDED COMMON EQUITY COST RATE?

A. Yes. It has been marked for identification as MFR 6.4.4 and consists of Exhibit PMA-1 and Workpapers PMA-1 through PMA-9.

Q. WHAT IS YOUR RECOMMENDED OVERALL RATE OF RETURN?

A. I recommend that the Delaware Public Service Commission ("DPSC" or "the Commission") authorize the Company the opportunity to earn an overall rate of return of 7.97%. The recommended overall rate of return is based upon the consolidated capital structure at December 31, 2015 of SUEZ Water Resources Inc. ("SWR") the parent of SWDE, consisting of 46.66% long-term debt at a cost rate of 5.19%, and 53.34% common equity at my recommended common equity cost rate of 10.40%, as shown below on Table 1 and Exhibit PMA-1. In addition my recommended market-based common equity cost rate of 10.40% demonstrates that SWDE's request for a return on common equity of 10.25% is both reasonable and conservative.

Table 1: Summary of the Overall Rate of Return for SWDE

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	46.66%	5.19%	2.42%
Common Equity	53.34	10.40	5.55
Totals	100.00%		7.97%

SUMMARY

Q. PLEASE SUMMARIZE YOUR RECOMMENDED COMMON EQUITY COST RATE.

A. My recommended common equity cost rate of 10.40% is summarized on of Workpaper PMA-1. As a wholly-owned subsidiary of SWR, SWDE's common stock is not publicly traded. Hence a market-based common equity cost rate cannot be determined directly for SWDE. Consequently, I have assessed the

market-based common equity cost rates of companies of relatively similar, but not necessarily identical risk, i.e., a proxy group, for insight into a recommended common equity cost rate applicable to SWDE. Using companies of relatively similar risk as proxies is consistent with the principle of fair rate of return established in the *Hope*[1] and *Bluefield*[2] cases, adding reliability to the informed expert judgment necessary to arrive at a recommended common equity cost rate. However, no proxy group can be selected to be identical in risk to SWDE. Therefore, the proxy group's results must be adjusted, if necessary, to reflect the unique relative investment (financial and / or business) risk of the Company.

My recommendation results from the application of market-based cost of common equity models, the Discounted Cash Flow ("DCF") approach, the Risk Premium Model ("RPM") and the Capital Asset Pricing Model ("CAPM"), to the market data of a proxy group of eight water companies whose selection will be discussed below. In addition, I also applied the DCF, RPM and CAPM to the market data of domestic, non-price regulated companies comparable in total risk to the eight water companies.

The results derived from each are as follows:

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1 *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591 (1944).

2 *Bluefield Water Works Improvement Co. v. Public Serv. Comm'n*, 262 U.S. 679 (1922).

Table 2

	Proxy Group of Eight Water Companies
Discounted Cash Flow Model	8.51%
Risk Premium Model	10.42
Capital Asset Pricing Model	9.93
Cost of Equity Models Applied to Comparable Risk, Non-Price Regulated Companies	11.21%
Indicated Common Equity Cost Rate	10.10%
Business Risk Adjustment	0.50%
Indicated Common Equity Cost Rate	10.40%
Recommended Common Equity Cost Rate	10.40%

After reviewing the cost rates based upon these models, I conclude that a common equity cost rate of 10.10% is indicated before any adjustment for SWDE's greater business risk relative to the proxy group of eight water companies as I discuss in more detail below. Thus, the indicated common equity cost rate based upon the eight water companies needs to be adjusted upward by 0.50% to reflect SWDE's greater business risk due to its smaller size relative to the proxy group. After adjustment, the common equity cost rate is 10.40% which is my recommended common equity cost rate and in my opinion, reasonable, if not conservative.

GENERAL COMMENTS ON CAPITAL MARKET CONDITIONS

Q. PLEASE DESCRIBE CURRENT CAPITAL MARKET CONDITIONS.

A. The U.S. economy is slowly recovering from the Great Recession of 2008 – 2009. The Federal Reserve Bank's ("Fed") Federal Open Market Committee ("FOMC") tapered off and concluded its quantitative easing in October 2014,[3] while maintaining the Federal Funds ("Fed Funds") rate and discount rate at record lows since December 2008. On December 16, 2015, as highly anticipated, the FOMC raised the target range for its federal funds rate from 0.00% - 0.25% to 0.25% - 0.50%, beginning an expected gradual process toward interest rate normalization. As a result of the FOMC's accommodative monetary policy to maintain interest rates lower than historical norms over the last seven years, the U.S. stock market has recovered remarkably, with the Dow Jones Industrial Average ("DJI") approximately 160% from its low of early March 2009, notwithstanding the market's recent extreme volatility in response to the turmoil in China's economy / markets, the global economy, falling oil prices, and the uncertainty and direction of the FOMC's interest rate decisions.

It remains to be seen how the capital markets will react as this process continues over the next couple of years. Although global capital markets are currently extremely volatile, bouncing into and out of correction territory almost daily, there is no consensus on whether the stock market is entering a long bullish period or will recover its losses and regain stability in the near future. One measure of the volatility, or risk, of the U.S. market is the Chicago Board Options Exchange ("CBOE") Volatility Index ("VIX®") which measures market expectations of near-term volatility of Standard & Poor's ("S&P") 500 stock index option prices. The VIX® is "considered to be the world's premier barometer of

[3] Purchase of mortgage backed securities.

investor sentiment and market volatility",[4] otherwise known as the "fear index". The VIX® is currently close to 19. A further measure of volatility is the actual volatility of the VIX®[5], is measured by its standard deviation, which for the three months of October 1, through December 21, 2015 was 2.386, in contrast to its standard deviation of 1.637 for the three months ended March 2009, the bottom of the post-Great Recession market. Such volatility indicates that, although interest rates are still near historical lows in the U.S. capital markets, there remains significant, if not greater, risk to common equity investment in today's markets, with investors requiring great returns to bear that risk, consistent with the basic financial principle of risk and return[6].

Clearly, capital markets have been and continue to reflect both the recent historically low interest rate environment engineered by the Fed and an expectation of rising interest rates. This engineering of interest rates impacts the measurement of the cost of capital, specifically the investor required return on common equity.

Q. WHAT IS YOUR OPINION ON THE FED'S ENGINEERING OF INTEREST RATES AND ITS EFFECT ON THE TRADITIONAL COST OF COMMON EQUITY MODELS?

A. In my opinion, the results of traditional cost of common equity models[7] should be viewed with even greater scrutiny under current economic and capital market conditions. The current low interest rate environment, coupled with the FOMC's

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4 www.cboe.com/micro/vix/vixintro.aspx

5 I was unable to obtain the historical data to calculate a similar comparative volatility of the VIXC®.

6 The risk and return principle states that the greater the perceived risk of an investment, the greater the return required by the investor.

engineering of interest rates, means that the traditional cost of common equity models (DCF, RPM and CAPM) will have a greater tendency to understate the investor required cost of common equity. Consesequently, the results of these cost of common equity models, including those presented in this analysis, are currently particularly conservative estimates (i.e. on the low side) of the investor required rate of return on common equity.

As noted by Michael Ivanovitch of CNBC,[8] "Through its direct and indirect control of American interest rates, the Fed exercises a decisive influence on dollar-denominated asset valuation models." The fact that such low interest rates are below the long-run "norm" is corroborated by the FOMC's own statements in the press release it issued following its latest meeting on December 15 - 16, 2015[9]. In the press release, the FOMC stated that "The Committee expects that economic conditions will evolve in a manner that will warrant only gradual increases in the federal funds rate; the federal funds rate is likely to remain, for some time, below levels that are expected to prevail in the longer run." After the FOMC decision, MarketWatch[10] noted that "[t]he Fed's short-term rate had [been] kept near zero for seven years, marking an unprecedented era in the history of U.S. monetary policy triggered by the worst financial crisis and economic downturn since the 1930s." MarketWatch further notes that the Fed's language would soften the blow of the end to easy money

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7 Discounted Cash Flow, Risk Premium and Capital Asset Pricing Models.

8 *"Only the Fed can crash Wall Street,"* finance.yahoo.com/news/only-fed-crash-wall-street-011223751.htm.

9 Board of Governors of the Federal Reserve System, Press Release, December 16, 2015.

10 "Federal Reserve embarks on historic new era of higher interest rates," www.marketwatch.com/story/fed-enters-new-era-of-higher-rates-2015-12-16/print.

and that the Fed stressed that the pace of future interest rate hikes would be gradual, with interest rates expected to rise more gradually in 2017 and 2018 than the Fed had previously predicted, making it clear that interest rates will not be rising quickly. Thus, although the Fed has begun with an initial increase in the fed funds target range, by no means will there be a return to historically normal interest rate levels in the foreseeable future.

These artificially low interest rates have led some analysts to the faulty conclusion that current capital costs are low and will continue to be so. These analysts are mistaken. Their conclusion only holds true under the hypothesis of Perfectly Competitive Capital Markets ("PCCM") and the classical valuation framework which, under normal economic and capital market conditions, underpins the traditional cost of common equity models. PCCM are capital markets where no single trader, known as a "market-mover", would have the power to change the prices of goods or services, including bond and common stock securities. In other words, under the PCCM hypothesis, no single trader would have a significant impact on market prices. Classic valuation theory means that investors trade securities rationally with prices reflecting their perceptions of value. However, although central banks have always had the ability to set the benchmark interest rates, they have been maintaining below normal rates to stimulate continued economic and capital market recovery. Thus, it is logical to conclude that the Fed and other central banks are acting as market-movers, which has a significant impact on the market prices of both bonds and stocks in all markets where a central bank is maintaining historically

low interest rates. The presence of a market-mover like the Fed in current capital markets invalidates the PCCM, which is the foundation of the traditional cost of common equity models. This is corroborated by Michael K. Farr of CNBC, who stated[11]:

> It seems like an eternity since the markets have behaved 'normally.' For at least the past 6 – 7 years, there has been a wholly different driver of supply and demand in the stock market. Market peaks and valleys have been clearly and unambiguously correlated to the various pronouncements of monetary support by the Federal Reserve. The financial market distortions created by the Fed will have a lasting impact on the economy for years to come." (emphasis added)

In addition, relative to an April 15, 2015 interview with CNBC's "Squawk Box", former U.S. Treasury Secretary Hank Paulson, noted[12]:

> … that stocks and other assets need to start to trade again on "real economic[s]," arguing the Federal Reserve should hike interest rates sooner rather than later.
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> * * *
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> He acknowledged the "disortational [sic] effects" of the Fed's easy money policies, which have benefited investors by pumping up assets, while hurting savers and Americans on fixed incomes.

More recently, John DeClue, chief investment officer at U.S. Bank Wealth Management corroborated the fact that the Fed is acting like a market mover when he stated that "We can still expect to see some significant drops in the market until we get some direction from the Fed regarding a rate increase.[13]"

In such a capital market, it is more important than ever to not only view

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11 Michael K. Farr, President, Farr, Miller & Washington, LLC, "Goldilocks lives! Time for Fed to stand down", www.cnbc.com/id/101888234 August 5, 2015. (See Appendix C, Citation XX)

12 "I worry about Fed-induced asset bubbles: Paulson," www.cnbc.com/id/102588168. (See Appendix C, Citation XX)

13 "Wall Street falls as investors fret about rate-hike timing," August 31, 2015, finance.yahoo.com/news/futures-fall-september-rate-hike-113415619.html. (See Appendix C, Citation XX)

the application of multiple cost of common equity models, including their inputs, with greater scrutiny, it is imperative to use projected data, including interest rates, growth rates and equity risk premiums, to estimate the cost of common equity. Doing so can only enhance the exercise of the informed expert judgment required of a rate of return analyst.

GENERAL PRINCIPLES

Q. WHAT GENERAL PRINCIPLES HAVE YOU CONSIDERED IN ARRIVING AT YOUR RECOMMENDED COMMON EQUITY COST RATE OF 10.40%?

A. In unregulated industries, the competition of the marketplace is the principal determinant of the price of products or services. For regulated public utilities, regulation must act as a substitute for marketplace competition. Assuring that the utility can fulfill its obligations to the public while providing safe and reliable service at all times requires a level of earnings sufficient to maintain the integrity of presently invested capital as well as permitting the attraction of needed new capital at a reasonable cost in competition with other firms of comparable risk. This is consistent with the fair rate of return standards established by the U.S. Supreme Court in the *Hope* and *Bluefield* cases. Consequently, marketplace data must be relied upon in assessing a common equity cost rate appropriate for ratemaking purposes. Therefore, my recommended common equity cost rate is based upon the marketplace data of a proxy group of utilities as similar in risk as possible to SWDE, based upon selection criteria that will be discussed subsequently. The use of the market data of a proxy group adds reliability to the necessary use of informed expert judgment in arriving at a

recommended common equity cost rate. Likewise, the use of multiple common equity cost rate models adds reliability when arriving at a recommended common equity cost rate.

BUSINESS RISK

Q. PLEASE DEFINE BUSINESS RISK AND EXPLAIN WHY IT IS IMPORTANT TO THE DETERMINATION OF A FAIR RATE OF RETURN.

A. Business risk is important to the determination of a fair rate of return because the greater the level of risk, the greater the rate of return investors demand, consistent with the basic financial principle of risk and return. Business risk is the riskiness of a company's common stock, without the Company's use of debt and/or preferred financing. Examples of the general business risks faced by all utilities, i.e., electric, natural gas distribution and water utilities, include, but are not limited to, the regulatory environment, customer mix and concentration of customers, service territory economic growth, market demand, supply, operations, capital intensity, size, and the degree of operating leverage, all of which have a direct bearing on earnings. An individual utility may face different levels of one or more particular risks.

Q. WHAT BUSINESS RISKS DOES THE WATER UTILITY INDUSTRY IN GENERAL FACE TODAY?

A. Water is essential to life as it is the only utility product which is intended for customers to ingest. Water quality is of paramount importance to the health and well-being of customers and is therefore subject to additional and increasingly strict health and safety regulations. Beyond health and safety concerns, water

utility customers also have significant aesthetic concerns regarding the water delivered to them with regulators paying close attention to these concerns because of the strong feelings they arouse in consumers. Also, water utilities serve a production function in addition to a delivery function.

Water utilities obtain supply from wells, aquifers, surface water reservoirs or streams and rivers. Throughout the years, well supplies and aquifers have been environmentally threatened, with historically minor purification treatment giving way to major well rehabilitation, extensive treatment or replacement. Simultaneously, safe drinking water quality standards have tightened considerably, requiring multiple treatments prior to water delivery. Supply availability is also limited by drought, water source overuse, runoff, threatened species and habitat protection, and other operational, political and environmental factors. In addition, the United States Environmental Protection Agency ("EPA"), as well as individual state and local environmental agencies, are continually monitoring potential contaminants in the water supply and promulgating or expanding regulations when necessary. Increasingly stringent environmental standards necessitate additional capital investment in the distribution and treatment of water, exacerbating the pressure on water utilities' free cash flows through increased capital expenditures for infrastructure, repair and replacement. In the course of procuring water supplies and treating water so that it complies with Safe Drinking Water Act ("SDWA") standards, water utilities have an ever-increasing responsibility to be stewards of the environment from which supplies are drawn, in order to preserve and protect essential natural resources of the

United States.

Hence, water utilities require significant capital investment not only in distribution and transmission systems but also in sources of supply (wells), production (treatment facilities), and storage. Significant capital investment is necessary both to serve additional customers and to replace aging systems, creating a major risk facing the water utility industry.

Value Line[14] observes the following about the water utility industry:

> Following yeas of underinvestment in the nation's water infrastructure, utilities are now spending heavily to replace old pipes, valves, and wastewater systems. This means that capital expenditures should be substantial through late decade.
>
> * * * *
>
> The United States' pipeline infrastructure is in terrible condition. Over the past five to 10 years, water utilities have, with the assistance of state regulators, begun large construction projects to replace old pipes, valves, and refurbish wastewater systems. In older cities and states, the same pipes laid over 100 years ago are still in use today.
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> * * * *
>
> Regulators and water companies seemed to be in a balanced relationship. State commissions have to protect homeowners from paying for unnecessary expenditures and unneeded expenses. On the other hand, they have to let utilities earn a competitive return on their money, or there will be no incentive for companies to invest the funds needed to maintain their operations.

The water utility industry is capital-intensive, meaning the investment in capital required to produce a dollar of revenue is larger than for other industries, including electric and natural gas utilities. For example, as shown on page 1 of

[14] *Value Line Investment Survey*, October 16, 2015, 1780.

Workpaper PMA-2, it took $3.95 of net utility plant on average to produce $1.00 in operating revenues in 2014 for the water utility industry as a whole. For SWDE specifically, it took a greater $4.53 of net utility plant to produce $1.00 in operating revenues in 2014. In contrast, for the electric, combination electric and gas and natural gas utility industries, on average it took only $2.65, $2.18 and $1.69, respectively, to produce $1.00 in operating revenues in 2014. As financing needs have increased and will continue to increase, the competition for capital from traditional sources has increased and continues to increase, making the need to maintain financial integrity and the ability to attract needed new capital increasingly important.

Q. WHY IS THERE AN INCREASED NEED FOR FINANCING?

A. As discussed previously, there are a number of challenges facing the water utility industry. The National Association of Regulatory Commissioners ("NARUC") reiterated the challenges facing the water utility industry stemming from its capital intensity. NARUC's Board of Directors adopted the following resolution in July 2013.[15]

> **WHEREAS**, There is both a constitutional basis and judicial precedent allowing investor owned public water and wastewater utilities the opportunity to earn a rate of return that is reasonably sufficient to assure confidence in the financial soundness of the utility and its ability to provide quality service; *and*
>
> **WHEREAS**, Through the *Resolution Supporting Consideration of Regulatory Policies Deemed as "Best Practices"* (2005), the National Association of Regulatory Utility Commissioners (NARUC) has previously recognized the role of innovative regulatory policies and mechanisms in the ability for public water

[15] "Resolution Supporting Consideration of Regulatory Policies Deemed as 'Best Practices'", Sponsored by the Committee on Water. Adopted by the NARUC Board of Directors, July 2013.

and wastewater utilities to address significant infrastructure investment challenges facing water and wastewater system operators; *and*

* * *

WHEREAS, Recent analysis shows that as compared to other regulated utility sectors, significant and widespread discrepancies continue to be observed between commission authorized returns on equity and observed actual returns on equity among regulated water and wastewater utilities; *and*

WHEREAS, The extent of such discrepancies suggests the existence of challenges unique to the regulation of water and wastewater utilities; *and*

* * *

WHEREAS, Deficient returns present a clear challenge to the ability of the water and wastewater industry to attract the capital necessary to address future infrastructure investment requirements necessary to provide safe and reliable service, which could exceed one trillion dollars over a 20-year period; *and*

WHEREAS, The NARUC Committee on Water recognizes the critical role of the implementation and the effective use of sound regulatory practice [sic] and the innovative regulatory policies identified in the *Resolution Supporting Consideration of Regulatory Policies Deemed as "Best Practices"*; and

* * *

RESOLVED, That the Board of Directors of the National Association of Regulatory Utility Commissioners, convened at its 2013 Summer Meeting in Denver, Colorado, identifies the implementation and effective use of sound regulatory practice [sic] and the innovative regulatory policies identified in the *Resolution Supporting Consideration of Regulatory Policies Deemed as "Best Practices"* (2005) as a critical component of a water and/or wastewater utility's reasonable ability to earn its authorized return; and *be it further*

RESOLVED, That NARUC recommends that economic regulators carefully consider and implement appropriate ratemaking measures as needed so that water and wastewater utilities have a reasonable opportunity to earn their authorized returns within their

jurisdictions...

SWDE itself is facing significant capital expenditures as it projects net capital expenditures of $88.9M for 2016 – 2020, representing an increase of more than 72% over 2014 net plant of $123.8M.

Not only is the water utility industry historically capital intensive, it is expected to incur significant capital expenditure needs over the next 15 years.

In 2011, the EPA stated the following:[16]

> The survey estimated a total national infrastructure need of $384.2 billion for the 20-year period from January 2011 through December 2030.
>
> * * *
>
> The large magnitude of the national need reflects the challenges confronting water systems as they deal with an infrastructure network that has aged considerably since these systems were constructed, in many cases, 50 to 100 years ago.
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> * * *
>
> With $247.5 billion in needs over the next 20 years, transmission and distribution projects represent the largest category of need. This result is consistent with the fact that transmission and distribution mains account for most of the nation's water infrastructure. The other categories, in descending order of need are: treatment, storage, source and a miscellaneous category of needs called "other".

Q. FROM WHERE WILL THE NECESSARY CAPITAL TO FUND THIS LEVEL OF INFRASTRUCTURE REPLACEMENT BE RAISED?

A. The question highlights the importance of capital attraction. Water utility capital expenditures as large as those projected by the EPA will require significant

[16] "Fact Sheet: "EPA's 2011 Drinking Water Infrastructure Needs Survey and Assessment," United States Environmental Protection Agency, Office of Water, April 2013.

financing. The three sources typically used for financing are debt, equity (common and preferred) and cash flow. All three are intricately linked to the opportunity to earn a sufficient rate of return as well as the ability to actually achieve that return. Consistent with *Hope* and *Bluefield*, the return must be sufficient enough to maintain credit quality as well as enable the attraction of necessary new capital, be it debt or equity capital. If unable to raise debt or equity capital, the utility must turn to either retained earnings or free cash flow [operating cash flow (funds from operations) minus capital expenditures], both of which are directly linked to earning a sufficient rate of return. The level of free cash flows represents the financial flexibility of a company or a company's ability to meet the needs of its debt and equity holders. If either retained earnings or free cash flows are inadequate, it will be nearly impossible for the utility to attract the necessary new capital, on reasonable terms, to invest in needed new infrastructure. It is thus clear that an insufficient rate of return can be financially devastating for utilities and for their customers.

In view of the foregoing, the water utility industry's high degree of capital intensity and low depreciation rates, coupled with the need for substantial infrastructure capital spending, makes the need to maintain financial integrity and the ability to attract needed new capital, through the allowance of a sufficient rate of return, increasingly important in order for water utilities to be able to successfully meet the challenges they face.

Q. PLEASE CONTINUE YOUR DISCUSSION OF BUSINESS RISKS.

A. Coupled with its capital-intensive nature, the water utility industry also

experiences lower relative depreciation rates as well. Given that depreciation is one of the principal sources of internal cash flows for all utilities, lower depreciation rates mean that water utility depreciation as a source of internally-generated cash. Since water utility assets have longer lives and, hence, longer capital recovery periods than other types of utilities, water utilities face greater risk due to inflation which results in a higher replacement cost per dollar of net plant than for other types of utilities. As shown on page 2 of Workpaper PMA-2, water utilities experienced an average depreciation rate of 3.0% for 2014, with SWDE experiencing a lower rate of 2.5%. In contrast, in 2014, the electric, combination electric and gas and natural gas utilities experienced average depreciation rates of 3.3%, 3.4% and 3.7%, respectively. Low depreciation rates signify that the pressure on cash flows remains significantly greater for water utilities than for other types of utilities.

FINANCIAL RISK

Q. PLEASE DEFINE FINANCIAL RISK AND EXPLAIN WHY IT IS IMPORTANT TO THE DETERMINATION OF A FAIR RATE OF RETURN.

A. Financial risk is the additional risk created by the introduction of senior capital, i.e., debt and preferred stock, into the capital structure. The higher the proportion of senior capital in the capital structure, the higher the financial risk which must be factored into the common equity cost rate, consistent with the previously mentioned basic financial principle of risk and return, i.e., investors demand a higher common equity return as compensation for bearing higher investment risk.

Q. CAN THE COMBINED BUSINESS RISKS, I.E., INVESTMENT RISK OF AN ENTERPRISE, BE PROXIED BY BOND AND CREDIT RATINGS?

A. Yes, similar bond/issuer credit (bond/credit) ratings reflect and are representative of similar combined business and financial risks, i.e., total risk faced by bond investors. Although specific business or financial risks may differ between companies, the same bond/credit rating indicates that the combined risks are similar, albeit not necessarily equal, as the purpose of the bond/credit rating process is to assess credit quality or credit risk and not common equity risk. Risk distinctions within Standard & Poor's ("S&P") bond/issuer rating categories are recognized by a plus or minus, i.e., within the A category, an S&P rating can be at A+, A, or A-. Similarly, risk distinctions for Moody's ratings are distinguished by numerical rating gradations, i.e., within the A category, a Moody's rating can be A1, A2 and A3.

SUEZ WATER DELAWARE INC.

Q. PLEASE DESCRIBE SWDE.

A. SWDE provides water service to approximately 38,000 customers throughout Wilmington, Bellefonte, Arden, Newport, Christiana and Claymont in New Castle County, Delaware. As a wholly-owned subsidiary of SWR, SWDE's common stock is not publicly traded.

PROXY GROUP

Q. PLEASE EXPLAIN HOW YOU CHOSE THE PROXY GROUP OF EIGHT WATER COMPANIES.

A. I chose the proxy group by selecting those companies which meet the following

criteria: 1) they are included in the *Value Line's* standard edition (October 16, 2015; 2) they have 70% or greater of 2014 total operating income derived from and 70% or greater of 2014 total assets devoted to regulated water operations; 3) at the time of the preparation of this testimony, they had not publicly announced that they were involved in any major merger or acquisition activity, i.e., one publicly-traded utility merging with or acquiring another; 4) they have not cut or omitted their common dividends during the five years ending 2014 or through the time of the preparation of this testimony; 5) they have *Value Line* and Bloomberg adjusted betas; and 6) they have *Value Line*, Reuters, Zacks or Yahoo! Finance, consensus five-year earnings per share ("EPS") growth rate projections. The following eight companies met these criteria: American States Water Co., American Water Works Co., Inc., Aqua America, Inc., California Water Service Corp., Connecticut Water Service, Inc., Middlesex Water Co., SJW Corp. and York Water Co.

Q. HAVE YOU REVIEWED FINANCIAL DATA FOR THE PROXY GROUP?

A. Yes. Page 1 of Workpaper PMA-3 contains comparative capitalization and financial statistics for the eight proxy group water companies for the years 2010-2014.

As shown on page 1, during the five-year period ending 2014, the historically achieved average earnings rate on book common equity for the group averaged 10.03%. The average common equity ratio based upon permanent capital (excluding short-term debt) was 51.24%, and the average dividend payout ratio was 60.38%.

Total debt outstanding as a percent of EBITDA for the years 2010-2014 ranged between 3.40 and 4.55 times, averaging 3.95 times, while funds from operations relative to total debt range between 17.60% and 25.99%, averaging 21.34%.

COMMON EQUITY COST RATE MODELS

Q. ARE THE COST OF COMMON EQUITY MODELS YOU USE MARKET-BASED MODELS?

A. Yes. It is important to use market-based models because the cost of common equity is a function of investors' perception of risk, which is embodied in the market prices they pay. The DCF model is market-based in that market prices are utilized in developing the dividend yield component of the model. The RPM is market-based in that the bond/issuer ratings and expected bond yields used in the application of the RPM reflect the market's assessment of bond/credit risk. Also, market prices are used in the development of the returns and equity risk premiums used in the Predictive Risk Premium Model ("PRPM"). In addition, the use of betas to determine the equity risk premium also reflects the market's assessment of market/systematic risk as betas are derived from regression analyses of market prices. The CAPM is market-based for many of the same reasons that the RPM is market-based i.e., the use of expected bond (U.S. Treasury bond) yields and betas.

DISCOUNTED CASH FLOW MODEL ("DCF")

Q. WHAT IS THE THEORETICAL BASIS OF THE DCF MODEL?

A. The theoretical basis of the DCF model is that the present value of an expected

future stream of net cash flows during the investment holding period can be estimated by discounting those cash flows at the cost of capital, or the investors' capitalization rate. DCF theory indicates that an investor buys a stock for an expected total return rate, which is derived from cash flows received in the form of dividends plus appreciation in market price (the expected growth rate). Mathematically, the dividend yield on market price plus a growth rate equals the capitalization rate, i.e., the total common equity return rate expected by investors.

Q. WHICH VERSION OF THE DCF MODEL DO YOU USE?

A. I utilize the single-stage constant growth DCF model because, in my experience, it is the most widely utilized version of the DCF in public utility rate regulation. In my opinion, it is widely utilized because utilities are generally in the mature stage of their lifecycles and not transitioning from one growth stage to another.

Q. PLEASE DESCRIBE THE DIVIDEND YIELD YOU USED IN YOUR APPLICATION OF THE DCF MODEL.

A. The unadjusted dividend yields are based upon a recent (November 30, 2015) indicated dividend divided by the average of closing market prices for the 60 days ending November 30, 2015 as shown in Column [1] on page 1 of Workpaper PMA-4.

Q. PLEASE EXPLAIN THE ADJUSTED DIVIDEND YIELD SHOWN ON PAGE 1 OF WORKPAPER PMA-4, COLUMN [7].

A. Because dividends are paid periodically (quarterly), as opposed to continuously (daily), an adjustment must be made to the dividend yield. This is often referred

to as the discrete, or the Gordon Periodic, version of the DCF model.

DCF theory calls for the use of the full growth rate, or D_1, in calculating the dividend yield component of the model. However, since the various companies in the proxy group increase their quarterly dividend at various times during the year, a reasonable assumption is to reflect one-half the annual dividend growth rate in the dividend yield component, or $D_{1/2}$. This is a conservative approach, which does not overstate the dividend yield that should be representative of the next twelve-month period. Therefore, the actual average dividend yields in Column [1] on page 1 of Workpaper PMA-4 have been adjusted upward to reflect one-half the average projected growth rate shown in Column [6].

Q. PLEASE EXPLAIN THE BASIS OF THE GROWTH RATES OF THE PROXY GROUP THAT YOU USE IN YOUR APPLICATION OF THE DCF MODEL.

A. Individual investors are more likely to place great significance on the opinions expressed by financial information services, such as *Value Line*, Reuters, Zacks and Yahoo! Finance. Investors recognize that such analysts have significant insight into the dynamics of the industries and individual companies they analyze, as well as an entity's historical and future abilities to effectively manage the effects of changing laws and regulations and ever changing economic and market conditions.

In addition, over the long run, there can be no growth in dividends per share ("DPS") without growth in EPS. Security analysts' earnings expectations have a more significant influence on market prices than dividend expectations. Thus, the use of earnings growth rates in a DCF analysis provides a better

matching between investors' market price appreciation expectations and the growth rate component of the DCF. Therefore, I use analysts' five-year forecasts of EPS growth in my DCF analysis.

Security analysts' earnings expectations have a significant, but not sole, influence on market prices and are therefore reasonable indicators of investor expectations.[17] As noted by Morin[18]:

> Because of the dominance of institutional investors and their influence on individual investors, analysts' forecasts of long-run growth rates provide a sound basis for estimating required returns. Financial analysts exert a strong influence on the expectations of many investors who do not possess the resources to make their own forecasts, that is, they are a cause of g.

Thus, the use of earnings growth rates in a DCF analysis provides a better matching between investors' market price appreciation expectations and the growth rate component of the DCF than other proxies for growth, e.g., historical EPS or DPS growth rates.

Q. PLEASE SUMMARIZE YOUR DCF MODEL RESULTS.

A. As shown on page 1 of Workpaper PMA-4, the mean result of the single-stage DCF model is 8.50%, while the median result is 8.51%. I have averaged these two results in arriving at a conclusion of a DCF-indicated common equity cost rate of 8.51% for the proxy group. By doing so, I have not only considered the DCF results for each company, but have not given undue weight to outliers on either the high or the low side.

THE RISK PREMIUM MODEL ("RPM")

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17 Roger A. Morin, New Regulatory Finance (Public Utility Reports, Inc., 2006) 298-303.

18 Morin 298.

Q. PLEASE DESCRIBE THE THEORETICAL BASIS OF THE RPM.

A. The RPM is based upon the basic financial principle of risk and return, i.e., that investors require greater returns for bearing greater risk. The RPM recognizes that common equity capital has greater investment risk than debt capital, as common equity shareholders are last in line in any claim on an entity's assets and earnings, with debt holders being first in line. Therefore, investors require higher returns from investment in common stocks than from investment in bonds to compensate them for bearing the additional risk.

While the investor required common equity return cannot be directly determined or observed, it is possible to directly observe bond returns and yields. According to RPM theory, one can assess a common equity risk premium over bonds, either historically or prospectively, and then use that premium to derive a cost rate of common equity. In summary, according to RPM theory, the cost of common equity equals the expected cost rate for long-term debt capital plus a risk premium over that cost rate to compensate common shareholders for the added risk of being unsecured and last-in-line for any claim on a corporation's assets and earnings.

Q. PLEASE EXPLAIN HOW YOU DERIVED YOUR INDICATED COST OF COMMON EQUITY BASED UPON THE RPM.

A. I relied upon the results of the application of two risk premium methods. The first method is the Predictive Risk Premium Model ("PRPM"), while the second method is a risk premium model using an adjusted total market approach.

Q. PLEASE EXPLAIN THE PRPM.

A. The PRPM, published in the *Journal of Regulatory Economics ("JRE")*[19] and *The Electricity Journal ("TEJ")*,[20] was developed from the work of Robert F. Engle who shared the Nobel Prize in Economics in 2003 "for methods of analyzing economic time series with time-varying volatility ("ARCH")"[21] with "ARCH" standing for autoregressive conditional heteroskedasticity. In other words, the volatility of stock returns and equity risk premiums changes over time and is related from one period to the next. Engle discovered that the volatility in market prices, returns, and equity risk premiums also clusters over time, making them highly predictable and available to predict future levels of risk and risk premiums. In other words, the predicted equity risk premium is generated by the prediction of volatility (risk). The PRPM estimates the risk / return relationship directly by analyzing the actual results of investor behavior rather than using subjective judgment as to the inputs required for the application of other cost of common equity models. Thus, the PRPM is not based upon an estimate of investor behavior, but rather upon the evaluation of the actual results of that behavior, i.e., the variance of historical equity risk premiums.

The inputs to the model are the historical returns on the common shares of each utility in the proxy group minus the historical monthly yield on long-term U.S. Treasury securities through November 2015. Using a generalized form of

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19 "A New Approach for Estimating the Equity Risk Premium for Public Utilities", Pauline M. Ahern, Frank J. Hanley and Richard A. Michelfelder, Ph.D. The Journal of Regulatory Economics (December 2011), 40:261-278.

20 "Comparative Evaluation of the Predictive Risk Premium Model™, the Discounted Cash Flow Model and the Capital Asset Pricing Model", Pauline M. Ahern, Richard A. Michelfelder, Ph.D., Rutgers University, Dylan W. D'Ascendis, and Frank J. Hanley, The Electricity Journal (May, 2013).

21 www.nobelprize.org

ARCH, known as GARCH, each water utility's projected equity risk premium was determined using Eviews© statistical software. The forecasted 30-year U.S. Treasury Bond (Note) yield of 3.70% is based upon the consensus forecast for the six quarters ending with the first quarter 2017 derived from the December 1, 2015 *Blue Chip Financial Forecasts ("Blue Chip")* averaged with the long-range forecasts for 2017-2021 and 2022-2026 also from the December 1, 2015 *Blue Chip* (shown on pages 9 and 10 of Workpaper PMA-5) as discussed below. The risk-free rate of 3.70% was then added to each company's PRPM-derived equity risk premium to arrive at a PRPM-derived cost of common equity as shown on page 2 of Workpaper PMA-5 which presents the average and median results for each proxy company. As shown on page 2, the average PRPM indicated common equity cost rate is 11.43%, while the median is 10.39% for the eight water companies. Consistent with my use of the average of the average and median DCF results, I rely upon the average of the average and median PRPM results of 10.91%[22] as my conclusion of PRPM cost rate.

Q. PLEASE EXPLAIN THE ADJUSTED TOTAL MARKET APPROACH RPM.

A. The adjusted total market approach RPM adds a prospective public utility bond yield to an equity risk premium which is derived from a beta-adjusted total market equity risk premium and an equity risk premium based upon the S&P Utilities Index.

Q. PLEASE EXPLAIN THE BASIS OF THE ADJUSTED PROSPECTIVE BOND YIELD OF 5.31% APPLICABLE TO THE EIGHT WATER COMPANIES SHOWN

[22] (10.91% = (11.43% + 10.39%) / 2).

ON PAGE 3 OF WORKPAPER PMA-5.

A. The first step in the adjusted total market approach RPM analysis is to determine the expected bond yield. Because both ratemaking and the cost of capital, including common equity cost rate, are prospective in nature, a prospective yield on long-term debt, similarly rated to the proxy group, is essential. Hence, I rely upon the consensus forecast of about 50 economists of the expected yield on Aaa rated corporate bonds for the six calendar quarters ending with the first calendar quarter of 2017 as derived from the December 1, 2015 *Blue Chip* averaged with the long-range forecasts for 2017-2021 and 2022-2026 also from the December 1, 2015 *Blue Chip* (shown on pages 9 and 10 of Workpaper PMA-5). As shown on Line No. 1 of page 3, the average expected yield on Moody's Aaa rated corporate bonds is 4.79%. An adjustment of 0.33% is necessary to adjust that average Aaa corporate bond yield to be equivalent to a Moody's A rated public utility bond, as shown on Line No. 2 and explained in Note 2 resulting in an expected bond yield applicable to a Moody's A rated public utility bond of 5.12% as shown on Line No. 3.

Since the eight water companies' average Moody's issuer rating is A2/A3, an adjustment of 0.19% is necessary to make the prospective bond yield applicable to the proxy group's average A2/A3 long-term issuer rating, as detailed in Note 3 on page 3 of Workpaper PMA-5. Therefore, the adjusted prospective bond yield is 5.31% for the eight water companies as shown on Line No. 5.

Q. PLEASE EXPLAIN THE METHOD OF ESTIMATING THE EQUITY RISK

PREMIUM IN THE ADJUSTED TOTAL MARKET APPROACH.

A. I evaluated the results of market equity risk premium studies based upon Ibbotson Associates' data, *Value Line's* forecasted total annual market return plus a projected total return on the S&P 500 in excess of the prospective yield on Moody's Aaa corporate bonds, as well as three different studies of the equity risk premium for public utilities with Moody's A rated bonds as detailed on pages 8 and 11 of Workpaper PMA-5. As shown on Line No. 3, page 7 of Workpaper PMA-5, the average equity risk premium is 4.62% applicable to the eight water companies. This estimate is the result of a beta-derived equity risk premium averaged with the average public utility equity risk premium based upon holding period returns relative to bonds rated A by Moody's.

Q. PLEASE EXPLAIN THE BASIS OF THE BETA-DERIVED EQUITY RISK PREMIUM.

A. The basis of the beta-derived equity risk premium applicable to the proxy group is shown on page 8 of Workpaper PMA-5. The beta-determined equity risk premium is relevant because betas are derived from the market prices of common stocks over a recent five-year period. Beta is a measure of relative risk to the market as a whole and a logical means by which to allocate an entity's/proxy group's share of the total market's equity risk premium relative to corporate bond yields.

The total market equity risk premium utilized is 5.26%, based upon an average of the long-term arithmetic mean historical market equity risk premium; a predicted market equity risk premium based upon the PRPM; a forecasted

market equity risk premium based upon *Value Line's* projected market appreciation and dividend yield; and, a forecasted market equity risk premium based upon the S&P 500's projected market appreciation and dividend yield as detailed below and in Notes 1 through 4 on page 8 of Workpaper PMA-5.

Q. HOW DID YOU DERIVE THE LONG-TERM HISTORICAL MARKET EQUITY RISK PREMIUM?

A. To derive the historical (expectational) market equity risk premium, I used the most recent Morningstar data on holding period returns for the large company common stocks from the Stocks, Bonds, Bill and Inflation Ibbotson® SBBI® 2015 Market Report ("SBBI – 2015 Market Report")[23] and the average historical yield on Moody's Aaa and Aa rated corporate bonds for the period 1926-2014. Moreover, the use of holding period returns over a very long period of time is useful because it is consistent with the long-term investment horizon presumed by the DCF model.

Consequently, as explained in Note 1 on page 8 of Workpaper PMA-5, the long-term arithmetic mean monthly total return rate on large company common stocks of 12.07% and the long-term arithmetic mean monthly yield on Moody's Aaa and Aa rated corporate bonds of 6.18% were used. As shown on Line No. 1, the resultant long-term historical equity risk premium on the market as a whole is 5.89%.

I used arithmetic mean monthly total return rates for the large company stocks and yields (income returns) for Moody's Aaa/Aa corporate bonds,

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[23] Stocks, Bonds, Bills and Inflation Ibbotson® SBBI® 2015 Market Report, Morningstar, Inc., 2015.

because they are appropriate for cost of capital purposes as noted in the Ibbotson® SBBI® 2015 Classic Yearbook – Market Results for Stocks, Bonds, Bill and Inflation 1926 – 2015 ("SBBI – 2015")[24]. Arithmetic mean return rates and yields are appropriate because ex-post (historical) total returns and equity risk premiums differ in size and direction over time, providing insight into the variance and standard deviation of returns. Because the arithmetic mean captures the prospect for variance in returns and equity risk premiums, it provides the valuable insight needed by investors in estimating future risk when making a current investment. Absent such valuable insight into the potential variance of returns, investors cannot meaningfully evaluate prospective risk. If investors alternatively relied upon the geometric mean of ex-post equity risk premiums, they would have no insight into the potential variance of future returns because the geometric mean relates the change over many periods of time to a constant rate of change, thereby obviating the period-to-period fluctuations, or variance, *critical to risk analysis.*

Only the arithmetic mean takes into account all of the returns / premiums, hence, providing meaningful insight into the variance and standard deviation of those returns / premiums.

Q. PLEASE EXPLAIN THE DERIVATION OF PRPM MARKET EQUITY RISK PREMIUM.

A. The inputs to the model are the historical monthly returns on large company common stocks from the SBBI – 2015 Market Report minus the monthly yields on

[24] Ibbotson® SBBI® 2015 Classic Yearbook – Market Results for Stocks, Bonds, Bills and Inflation 1926 – 2014, Morningstar, Inc., 2015 153.

Aaa and Aa corporate bonds during the period from January 1926 through October 2015 (the latest available at the time of the preparation of this testimony), consistent with the rationale for using of the long-term historical arithmetic market equity risk premium discussed above. Using the previously discussed generalized form of ARCH, known as GARCH, the market's projected equity risk premium was determined using Eviews© statistical software. The resulting predicted market equity risk premium based upon the PRPM of 7.06%.

Q. PLEASE EXPLAIN THE DERIVATION OF A MARKET EQUITY RISK PREMIUM BASED UPON *VALUE LINE'S* 3-5 YEAR ESTIMATED MEDIAN TOTAL ANNUAL MARKET RETURN MINUS THE PROSPECTIVE YIELD ON AAA RATED CORPORATE BONDS IN YOUR DEVELOPMENT OF A MARKET EQUITY RISK PREMIUM FOR YOUR RPM ANALYSIS.

A. Because both ratemaking and the cost of capital, including the cost rate of common equity, are prospective, a prospective market equity risk premium is essential. The derivation of the *Value Line* based forecasted or prospective market equity risk premium of 7.60% can be found in Note 3 on page 8 of Workpaper PMA-5. Consistent with the development of the dividend yield component of my DCF analysis, it is derived from an average of the most recent thirteen weeks ending December 4, 2015 3-5 year estimated median market price appreciation potential by *Value Line* plus an average of the median estimated dividend yield for the common stocks of the approximately 1,700 firms covered in *Value Line*'s Standard Edition.

The average median expected price appreciation is 47%, which translates

to a 10.11% annual appreciation and, when added to the average (similarly calculated) median dividend yield of 2.28% equates to a forecasted annual total return rate on the market as a whole of 12.39%. The forecasted total market equity risk premium of 7.60%, shown on Line No. 3, page 8 of Workpaper PMA-5, is derived by deducting the 4.79% prospective yield on Moody's Aaa rated corporate bonds discussed previously from the *Value Line*-derived projected market return of 12.39%[25].

Q. PLEASE EXPLAIN THE DERIVATION OF THE MARKET EQUITY RISK PREMIUM BASED UPON THE S&P 500.

A. Using data from Bloomberg Professional Services, an expected total return for the S&P 500 can be derived by adding the expected dividend yield for the S&P 500 to long-term growth in earnings per share as a proxy for capital appreciation. The expected total return for the S&P 500 is 13.47%. Subtracting the prospective yield on Moody's Aaa rated corporate bonds of 4.79% results in a 8.68%[26] projected market equity risk premium.

In arriving at my conclusion of market equity risk premium of 7.31%[27] on Line No. 4 on page 8, I averaged the historical market equity risk premium of 5.89%; the PRPM based market equity risk premium of 7.06%; the *Value Line*-based forecasted market equity risk premium of 7.60%; and, the S&P 500 projected market equity risk premium of 8.68% shown on Line Nos. 1 through 4.

Q. WHAT IS YOUR CONCLUSION OF A BETA-DERIVED EQUITY RISK PREMIUM FOR USE IN YOUR RPM ANALYSIS?

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[25] (7.60% = 12.39% - 4.79%).

A. As shown on page 1 of Workpaper PMA-6, the most current mean and median *Value Line* betas for the eight water companies average 0.72. Applying a beta of 0.72 to the market equity risk premium of 7.31%, on Line No. 4 of page 8 of Workpaper PMA-5, results in a beta adjusted equity risk premium of 5.26% for the eight water companies.

Q. HOW DID YOU DERIVE THE 3.97% EQUITY RISK PREMIUM BASED UPON THE S&P UTILITY INDEX AND MOODY'S A RATED PUBLIC UTILITY BONDS?

A. First, I derived the long-term monthly arithmetic mean equity risk premium between the S&P Utility Index total returns of 10.69% and monthly A rated public utility bond yields of 6.67% from 1928-2014 to arrive at an equity risk premium of 4.02% as shown on Line No. 3 on page 11 of Workpaper PMA-5. I then performed the PRPM using historical monthly equity risk premiums from January 1928 through October 2015 to arrive at the PRPM derived equity risk premium of 4.01% for the S&P Utility Index shown on Line No. 4, on page 11. Finally, I derived the projected total return on the S&P Utilities Index using data from Bloomberg Professional Services of 9.01%, identically to the projected total return on the S&P 500 discussed above, and subtracting the prospective Moody's A rated public utility bond yield of 5.12% from Line No. 3 on page 3 of Workpaper PMA-5. The resulting equity risk premium is 3.89%

I rely upon the average of the historical (4.02%); the PRPM (4.01%) and

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[26] (8.68% = 13.47% - 4.79%).

[27] (7.31% = ((5.89% + 7.06% + 7.60% + 8.68%) / 4).

S&P Utilities Index (3.89%) derived equity risk premiums, which is 3.97%[28].

Q. WHAT IS YOUR CONCLUSION OF AN EQUITY RISK PREMIUM FOR USE IN YOUR ADJUSTED TOTAL MARKET APPROACH RPM ANALYSIS?

A. The equity risk premium applicable to the proxy group of eight water companies is 4.62[29], derived by averaging the beta-derived premium of 5.26% with the equity risk premium of 3.97% based upon the holding period returns of public utilities with Moody's A rated bonds, as summarized on Line No. 3 on Workpaper PMA-5, page 7.

Q. WHAT IS THE INDICATED RPM COMMON EQUITY COST RATE BASED UPON THE ADJUSTED TOTAL MARKET APPROACH?

A. It is 9.93% for the eight water companies as shown on Line No. 7 on Workpaper PMA-5 page 3.

Q. WHAT ARE THE RESULTS OF YOUR APPLICATION OF THE PRPM AND THE ADJUSTED TOTAL MARKET APPROACH RPM?

A. As shown on page 1 of Workpaper PMA-5, the indicated RPM-derived common equity cost rate is 10.42%[30], derived by averaging the PRPM results of 10.91% with those of 9.93% based upon the adjusted total market approach.

THE CAPITAL ASSET PRICING MODEL ("CAPM")

Q. PLEASE EXPLAIN THE THEORETICAL BASIS OF THE CAPM.

A. CAPM theory defines risk as the covariability of a security's returns with the market's returns as measured by beta (β). A beta less than 1.0 indicates lower variability while a beta greater than 1.0 indicates greater variability than the

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[28] (3.97% = ((4.02% + 4.01% + 3.89%) / 3).

market.

The CAPM assumes that all other risk, i.e., all non-market or unsystematic risk, can be eliminated through diversification. The risk that cannot be eliminated through diversification is called market or systematic risk. In addition, the CAPM presumes that investors require compensation only for these systematic risks that are the result of macroeconomic and other events that affect the returns on all assets. The model is applied by adding a risk-free rate of return to a market risk premium, which is adjusted proportionately to reflect the systematic risk of the individual security relative to the total market as measured by beta. The traditional CAPM model is expressed as:

$$R_s = R_f + \beta(R_m - R_f)$$

Where: R_s = Return rate on the common stock

R_f = Risk-free rate of return

R_m = Return rate on the market as a whole

β = Adjusted beta (volatility of the security relative to the market as a whole)

Numerous tests of the CAPM have measured the extent to which security returns and betas are related as predicted by the CAPM confirming its validity. The empirical CAPM ("ECAPM") reflects the reality that while the results of these tests support the notion that beta is related to security returns, the empirical Security Market Line ("SML") described by the CAPM formula is not as steeply sloped as the predicted SML.[31] Morin[32] states:

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29 (4.62% = (5.26% + 3.97%) / 2).

30 (10.42% = ((10.91% + 9.93%) / 2).

31 Morin 175.

> With few exceptions, the empirical studies agree that ... low-beta securities earn returns somewhat higher than the CAPM would predict, and high-beta securities earn less than predicted.
>
> * * *
>
> Therefore, the empirical evidence suggests that the expected return on a security is related to its risk by the following approximation:
>
> $$K = R_F + x\,\beta(R_M - R_F) + (1-x)\,\beta(R_M - R_F)$$
>
> where x is a fraction to be determined empirically. The value of x that best explains the observed relationship Return = 0.0829 + 0.0520 β is between 0.25 and 0.30. If x = 0.25, the equation becomes:
>
> $$K = R_F + 0.25(R_M - R_F) + 0.75\,\beta(R_M - R_F)$$ [33]

In view of theory and practical research, I have applied both the traditional CAPM and the ECAPM to the companies in the proxy group and averaged the results.

Q. PLEASE DESCRIBE YOUR SELECTION OF THE BETA COEFFICIENT FOR YOUR CAPM ANALYSIS?

A. I relied upon an average of the adjusted betas published by the *Value Line* and provided by Bloomberg Professional Services.

Q. PLEASE DESCRIBE YOUR SELECTION OF A RISK-FREE RATE OF RETURN FOR YOUR CAPM ANALYSIS.

A. As shown in column [3] Workpaper PMA-6, the risk-free rate adopted for both applications of the CAPM is 3.70%. The risk-free rate for my CAPM analysis is

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[32] Morin 175.

[33] Morin 190.

based upon the average of the consensus forecast for the six quarters ending with the first calendar quarter of 2017 from the December 1, 2015 *Blue Chip* averaged with the long-range forecasts for 2017-2021 and 2022-2026 also from the December 1, 2015 *Blue Chip*, as shown in Note 2.

Q. WHY IS THE YIELD ON LONG-TERM U.S. TREASURY BONDS APPROPRIATE FOR USE AS THE RISK-FREE RATE?

A. The yield on long-term U.S. Treasury T-Bonds is almost risk-free and its term is consistent with the long-term cost of capital to public utilities measured by the yields on A rated public utility bonds, the long-term investment horizon inherent in utilities' common stocks, the long-term investment horizon presumed in the standard DCF model employed in regulatory ratemaking, and the long-term life of the jurisdictional rate base to which the allowed fair rate of return (i.e., cost of capital) will be applied. In contrast, short-term U.S. Treasury yields are more volatile and largely a function of Federal Reserve monetary policy.

Q. PLEASE EXPLAIN THE ESTIMATION OF THE EXPECTED EQUITY RISK PREMIUM FOR THE MARKET.

A. The basis of the market equity risk premium is explained in detail in Note 1 of Workpaper PMA-6. It is derived from *Value Line's* 3-5 year median total market price appreciation projections averaged over the most recent thirteen weeks ending December 4, 2015; the arithmetic mean monthly equity risk premiums of large company common stocks relative to long-term U.S. Treasury bond income yields from SBBI – 2015 Market Report from 1926-2014; the PRPM predicted market equity risk premium using monthly equity risk premiums for large

company common stocks relative to long-term U.S. Treasury securities from January 1926 through October 2015 (the latest available at the time of the preparation of this testimony); and, the projected total return on the S&P 500 less the projected risk free rate as detailed below and in Note 1 on of Workpaper PMA-6.

The *Value Line*-derived forecasted total market equity risk premium is derived by deducting the 3.70% risk-free rate discussed above from the *Value Line* projected total annual market return of 12.39%, also discussed above, resulting in a forecasted total market equity risk premium of 8.69%[34].

The long-term income return on U.S. Government Securities of 5.23% was deducted from the SBBI – 2015 Market Report monthly historical total market return of 12.07% resulting in an historical market equity risk premium of 6.84%.[35]

The PRPM market equity risk premium is 7.94%, derived using the PRPM, discussed above, relative to the yields on long-term U.S. Treasury securities from January 1926 through October 2015 (the latest available at the time of the preparation of this testimony).

The S&P 500 projected market equity risk premium of 9.77% is derived by subtracting the 3.70% projected risk-free rate, discussed above, from the projected total return of 13.47%, also discussed above.[36]

These four market equity risk premiums result in an average total market

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34 (8.69% = 12.39% - 3.70%).
35 (6.84% = 12.07% - 5.23%).
36 (9.77% = 13.47% - 3.70%),

equity risk premium of 8.31%.[37]

Q. WHAT ARE THE RESULTS OF YOUR APPLICATION OF THE TRADITIONAL AND EMPIRICAL CAPM TO THE PROXY GROUP?

A. As shown on Workpaper PMA-6, page 1, the mean traditional CAPM cost rate is 9.62% while the mean ECAPM result is 10.22%. The median traditional CAPM cost rate is 9.64% while the median ECAPM cost rate is 10.23%. Consistent with my reliance upon the average of the mean and median results of the DCF discussed above, I rely upon the average of the mean and median results of the traditional CAPM and ECAPM for the proxy group, 9.92% and 9.94%, respectively, or 9.93% as shown on column [6] on page 1 of Workpaper PMA-6.[38]

COMMON EQUITY COST RATES FOR THE PROXY GROUP OF DOMESTIC, NON-PRICE REGULATED COMPANIES BASED UPON THE DCF, RPM AND CAPM

Q. PLEASE DESCRIBE THE BASIS OF APPLYING COST OF COMMON EQUITY MODELS TO COMPARABLE RISK, NON-PRICE REGULATED COMPANIES.

A. Applying cost of common equity models to non-price regulated companies, comparable in total risk, is derived from the *"corresponding risk"* standard of the landmark cases of the U.S. Supreme Court, i.e., *Hope* and *Bluefield*, previously discussed. Therefore, it is consistent with the *Hope* doctrine that the return to the equity investor should be commensurate with returns on investments in other firms having corresponding risks based upon the fundamental economic concept of opportunity cost which maintains that the true cost of an investment is equal to

[37] (8.31% = ((8.69% + 6.84% + 7.94% + 9.77%) / 4).

the cost of the best available alternative use of the funds to be invested. The opportunity cost principle is also consistent with one of the fundamental principles upon which regulation rests: that regulation is intended to act as a surrogate for competition and to provide a fair rate of return to investors.

The first step in determining such an opportunity cost of common equity based upon a group of non-price regulated companies comparable in total risk to the eight water companies is to choose an appropriate broad-based proxy group of non-price regulated firms comparable in total risk to the proxy group of eight water companies which excludes utilities to avoid circularity.

The selection criteria for the non-price regulated firms of comparable risk are based upon statistics derived from the market prices paid by investors. *Value Line* betas were used as a measure of systematic risk. The standard error of the regression was used as a measure of each firm's unsystematic or specific risk with the standard error of the regression reflecting the extent to which events specific to a company's operations affect its stock price. In essence, companies which have similar betas and standard errors of the regression, have similar total investment risk. Using a *Value Line* proprietary database dated June 2015, the application of these criteria based upon the eight water companies results in a proxy group of non-price regulated firms comparable in total risk to the average water company in the proxy group of eight water companies as explained on page 1 and derived on page 2 of Workpaper PMA-7. Page 3 provides the identities of the companies in the proxy group of non-price regulated companies.

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[38] (9.93% = (9.92% + 9.94%) / 2).

Q. DID YOU CALCULATE COMMON EQUITY COST RATES USING THE DCF, RPM AND CAPM FOR THE PROXY GROUP OF DOMESTIC, NON-PRICE REGULATED COMPANIES THAT ARE COMPARABLE IN TOTAL RISK TO THE UTILITY PROXY GROUP?

A. Yes. Because the DCF, RPM and CAPM have been applied in an identical manner as described above relative to the market data of the eight water companies, I will not repeat the details of the rationale and application of each model shown on page 1 of Workpaper PMA-8. An exception is that, in the application of the RPM, I did not use public utility-specific equity risk premiums nor apply the PRPM to the individual companies.

Page 2 of Workpaper PMA-8 contains the derivation of the DCF cost rates. As shown, the average of the mean and median DCF cost rates for the proxy group of twenty non-price regulated companies comparable in total risk to the eight water companies, is 11.99%.

Pages 3 through 5 of Workpaper PMA-8 contain information relating to the 11.23% RPM cost rate for the proxy group of twenty non-price regulated companies summarized on page 3. As shown on Line No. 1 of page 3, the consensus prospective yield on Moody's Baa rated corporate bonds of 5.86% is based upon the forecasted yields for the six quarters ending with the first quarter of 2017 from the December 1, 2015 *Blue Chip*, averaged with the long-range forecasted yields for 2017-2021 and 2022-2026 also from the December 1, 2015 *Blue Chip*. Since the twenty non-price regulated companies comparable in total risk to the eight water companies have an average Moody's long-term issuer

rating of Baa1 as shown on page 4 of Workpaper PMA-8, a downward adjustment of 0.33% is necessary to make the prospective bond yield applicable to the Baa1 corporate bond yield. Thus, the expected specific bond yield is 5.53% for the twenty non-price regulated companies as shown on Line No. 3 on page 3 of Workpaper PMA-8. When the beta-adjusted risk premium of 5.70% relative to the proxy group of non-price regulated companies, as derived on page 5, is added to the prospective Baa rated corporate bond yields of 5.53%, the indicated RPM cost rate is 11.23%.

Page 6 of Workpaper PMA-8 contains the details of the application of the traditional CAPM and ECAPM to the proxy group of twenty non-price regulated companies comparable in total risk to the eight water companies. As shown, the mean and median traditional CAPM and ECAPM results are 10.33% and 10.38%, for the twenty non-price regulated companies which, when averaged, result in an indicated CAPM cost rate of 10.36%[39].

Q. WHAT IS YOUR CONCLUSION OF THE COST RATE OF COMMON EQUITY BASED UPON THE PROXY GROUP OF NON-PRICE REGULATED COMPANIES COMPARABLE IN TOTAL RISK TO THE EIGHT WATER COMPANIES?

A. As shown on page 1 of Workpaper PMA-8, the results of the DCF, RPM and CAPM applied to the non-price regulated group comparable in total risk to the eight water companies are 11.99%, 11.23% and 10.36%, respectively. Based upon these results, I will rely upon the average of the mean and median results

[39] (10.36% = (10.33% + 10.38%) / 2).

of the three models, which is 11.21% for the proxy group of non-price regulated companies as summarized on page 1 of Workpaper PMA-8.

CONCLUSION OF COMMON EQUITY COST RATE

Q. WHAT IS YOUR RECOMMENDED COMMON EQUITY COST RATE?

A. It is 10.40% based upon the indicated common equity cost rate resulting from the application of multiple cost of common equity models to the eight water companies adjusted for SWDE's business risk.

As discussed above, I employ multiple cost of common equity models as primary tools in arriving at my recommended common equity cost rate because: 1) no single model is so inherently precise that it can be relied upon solely to the exclusion of other theoretically sound models; 2) all of the models are market-based; 3) the use of multiple models adds reliability to the estimation of the common equity cost rate; and 4) the prudence of using multiple cost of common equity models is supported in both the financial literature and regulatory precedent. Therefore, no single model should be relied upon exclusively to estimate the investor required rate of return on common equity.

The results of the cost of common equity models applied to the eight water companies are shown on Workpaper PMA-1, and summarized below:

Table 3

	Proxy Group of Eight Water Companies
Discounted Cash Flow Model	8.51%
Risk Premium Model	10.42
Capital Asset Pricing Model	9.93
Cost of Equity Models Applied to Comparable Risk, Non-Price Regulated Companies	11.21%
Indicated Common Equity Cost Rate	10.10%
Business Risk Adjustment	0.50%
Indicated Common Equity Cost Rate	10.40%
Recommended Common Equity Cost Rate	10.40%

BUSINESS RISK ADJUSTMENT

Q. DOES SWDE FACE ANY UNIQUE BUSINESS RISK RELATIVE TO THE PROXY GROUP?

A. Yes. SWDE is smaller than the average company in the proxy group of eight water companies based upon estimated market capitalization. As shown on Workpaper PMA-9, page 1, SWDE's estimated market capitalization of $113.262 billion is lower than the average market capitalization of the proxy water group, $2.496 billion at November 30, 2015.

Consequently, SWDE has greater relative business risk because, all else being equal, size has a bearing on risk. Since investors demand a higher return in compensation for assuming greater risk, SWDE's greater relative business risk

must be reflected in the cost of common equity derived from the market data of the less business risky proxy companies in the proxy group.

Q. HOW DOES A COMPANY'S SIZE HAVE A BEARING ON BUSINESS RISK?

A. Size has a bearing in business risk and thus, the investor required common equity cost rate because smaller companies are simply less able to cope with significant events that affect sales, revenues and earnings. For example, smaller companies face more risk exposure to business cycles and economic conditions, both nationally and locally. Additionally, the loss of revenues from a few larger customers would have a greater effect on a small company than on a much bigger company with a larger, more diverse, customer base.

Further evidence that smaller firms are more risky is the fact that investors demand greater returns to compensate for the lack of marketability and liquidity of the securities of smaller firms. The fact that it is the use of funds invested, and not the source of those funds, which gives rise to the risk of any investment is a basic financial principle.[40]

Brigham[41] states:

> A number of researchers have observed that portfolios of small-firms have earned consistently higher average returns than those of large-firms stocks; this is called "small-firm effect." On the surface, it would seem to be advantageous to the small firms to provide average returns in a stock market that are higher than those of larger firms. In reality, it is bad news for the small firm; what *the small-firm effect means is that the capital market demands higher returns on stocks of small firms than on otherwise similar stocks of the large firms.* (italics added)

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[40] Brealey, Richard A. and Myers, Stewart C., Principles of Corporate Finance (McGraw-Hill Book Company, 1996) 204-205, 229.

[41] Brigham, Eugene F., Fundamentals of Financial Management, Fifth Edition (The Dryden Press, 1989) 623.

Consistent with the financial principle of risk and return discussed above, such increased risk due to small size must be taken into account in the allowed rate of return on common equity. Therefore, the Commission should authorize a cost of equity in this proceeding that appropriately reflects SWDE's relevant unique risks, including the impact of its small size.

Q. IS THERE A WAY TO QUANTIFY A BUSINESS RISK ADJUSTMENT DUE TO SWDE'S SMALL SIZE RELATIVE TO THE PROXY GROUP?

A. Yes. As discussed above, increased risk due to small size must be taken into account in the derivation of the cost of common equity consistent with the financial principle of risk and return. Since the Company is smaller in size relative to the proxy group, measured by the estimated market capitalization of common equity for SWDE, whose common stock is not traded, it has greater business risk than the average company in the proxy group.

Table 4

	Market Capitalization(1) ($ Millions)	Times Greater than the Company
SUEZ Water Delaware Inc.	$113.262	
Proxy Group of Eight Water Companies	$2,496.434	22.0x

(1) From page 1 of Workpaper PMA-9.

As derived on page 2 of Workpaper PMA-9, SWDE's estimated market capitalization based upon the proxy group's November 30, 2015 market-to-book

ratio was $113.262 billion. In contrast, the market capitalization of the average water company was $2.496 billion on November 30, 2015, or 22.0 times the size of SWDE's market capitalization.

Therefore, it is necessary to upwardly adjust the indicated common equity cost rate of 10.10% based upon the eight water companies to reflect SWDE's greater risk due to its smaller relative size. The determination is based upon the size premiums for decile portfolios of New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and NASDAQ listed companies for the 1926-2014 period and related data from Duff & Phelps 2015 Valuation Handbook Guide to Cost of Capital – Market Results through 2014 (D&P – 2015). The size premium for the 6th decile (1.74%) in which the eight water companies fall has been compared with the size premium for the 10th decile (5.78%) in which the estimated market capitalization of SWDE falls. As shown on page 1, the size premium spread between the 10th and 6th deciles is 4.04%. In view of the foregoing, I am recommending a business risk adjustment of 0.50% to reflect SWDE's smaller size relative to the proxy. In my opinion, a business risk adjustment of 0.50% is both reasonable and conservative.

After adjustment, the indicated common equity cost rate is 10.40%, which when rounded to 10.40% is my recommended common equity cost rate applicable to SWDE which demonstrates that SWDE's request for a return on common equity of 10.25% is both reasonable and conservative and should be authorized by this Commission.

Q. DOES THAT CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

Pauline M. Ahern, CRRA
Partner
Sussex Economic Advisors, LLC

Ms. Ahern has served as a consultant for investor-owned and municipal utilities and authorities for 27 years. As a Certified Rate of Return Analyst (CRRA), she has extensive experience in rate of return analyses, including the development of ratemaking capital structure ratios, senior capital cost rates, and the cost rate of common equity for regulated public utilities. She has testified as an expert witness before 29 regulatory commissions and one Canadian province.

She also maintains the benchmark index against which the American Gas Association's (AGA) Mutual Fund performance is measured. Ms. Ahern has also served as President of the Society of Utility Regulatory and Financial Analysts (SURFA) from 2006-2010 and now sits on its Board of Directors. SURFA is a non-profit organization founded to promote the education and understanding of rate of return analysis which represents utility financial analysts in government, the financial community, industry and academia. She also serves on the Finance/Accounting/Taxation Committees of the National Association of Water Companies. Ms. Ahern is also a member of the Advisory Council, Financial Research Institute, University of Missouri - Robert J. Trulaske, Sr. School of Business. She is also a member of Edison Electric Institute's Cost of Capital Working Group.

PROFESSIONAL HISTORY

Sussex Economic Advisors, LLC (2015 – Present)
Partner

AUS Consultants (1988 – 2015)
Principal

- Offered testimony as an expert witness on the subjects of fair rate of return, cost of capital and related issues before state public utility commissions.
- Provided assistance and support to clients throughout the entire ratemaking litigation process; supervision of the financial analyst and administrative staff in the preparation of fair rate of return and cost of capital testimonies and exhibits which are filed along with expert testimony before various state and federal public utility regulatory bodies as well as the preparation of interrogatory responses, as well as rebuttal exhibits.
- Responsible for the production, publishing, and distribution of the AUS Utility Reports (formerly C. A. Turner Utility Reports), which has provided financial data and related ratios for about 80 public utilities (*i.e.*, electric, combination gas and electric, natural gas distribution, natural gas transmission, telephone, and water utilities, on a monthly, quarterly and annual basis) since 1930. Subscribers include utilities, many state regulatory commissions, federal agencies, individuals, brokerage firms, attorneys, as well as public and academic libraries.
- Responsible for maintaining and calculating the performance of the AGA Index, a market capitalization weighted index of the common stocks of the approximately 70 corporate members of the AGA, which serves as the benchmark for the AGA Gas Utility Index Fund.

Assistant Vice President

- Prepared fair rate of return and cost of capital exhibits which were filed along with expert testimony before various state and federal public utility regulatory bodies; supporting exhibits include the determination of an appropriate ratemaking capital structure and the development of embedded cost rates of senior capital and also support the determination of a recommended return on common equity through the use of various market models, such as, but not limited to, Discounted Cash Flow analysis, Capital Asset Pricing Model and Risk

Premium Methodology, as well as an assessment of the risk characteristics of the client utility.

- Assisted in the preparation of responses to any interrogatories received regarding such testimonies filed on behalf of client utilities. Following the filing of fair rate of return testimonies, assisted in the evaluation of opposition testimony in order to prepare interrogatory questions, areas of cross-examination, and rebuttal testimony and evaluated and assisted in the preparation of briefs and exceptions following the hearing process.
- Submitted testimony before state public utility commissions regarding appropriate capital structure ratios and fixed capital cost rates.

Senior Financial Analyst

- Supervised two analysts and assisted in the preparation of fair rate of return and cost of capital exhibits which are filed along with expert testimony before various state and federal public utility regulatory bodies; the team also assisted in the preparation of interrogatory responses.
- Evaluated the final orders and decisions of various commissions to determine whether further actions were warranted and to gain insight which assisted in the preparation of future rate of return studies.
- Assisted in the preparation of an article authored by Frank J. Hanley and A. Gerald Harris entitled "Does Diversification Increase the Cost of Equity Capital?" published in the July 15, 1991 issue of Public Utilities Fortnightly.

Administrator of Financial Analysis for AUS Utility Reports

- Oversaw the preparation of this monthly publication, as well as the accompanying annual publication, Financial Statistics - Public Utilities.

Financial Analyst

- Assisted in the preparation of fair rate of return studies including capital structure determination, development of senior capital cost rates, determination of an appropriate rate of return on equity, preparation of interrogatory responses, interrogatory questions of the opposition, areas of cross-examination and rebuttal testimony, as well as preparation of the annual publication C. A. Turner Utility Reports - Financial Statistics - Public Utilities.

Research Dept. of the Regional Economics Division of the Federal Reserve Bank of Boston (1973 – 1975)

Research Assistant

- Involved in the development and maintenance of econometric models to simulate regional economic conditions in New England in order to study the effects of, among other things, the energy crisis of the early 1970's and property tax revaluations on the economy of New England. I was also involved in the statistical analysis and preparation of articles for the New England Economic Review. Also, I was Assistant Editor of New England Business Indicators.

Office of the Assistant Secretary for International Affairs, U.S. Treasury Department, Washington, D.C. (1972)

Research Assistant

- Developed and maintained econometric models which simulated the economy of the United States in order to study the results of various alternate foreign trade policies so that national trade policy could be formulated and recommended.

EDUCATION

M.B.A., Rutgers University, High Honors, 1991
B.A., Clark University, Honors, 1973

DESIGNATIONS AND PROFESSIONAL AFFILIATIONS

Advisory Council
Financial Research Institute
University of Missouri's Trulaske School of Business
Edison Electric Institute
Cost of Capital Working Group
National Association of Water Companies
Member of the Finance/Accounting/Taxation and Rates and Regulation Committees
Society of Utility and Regulatory Financial Analysts
Member, Board of Directors – 2010-2014 President – 2006-2008 and 2008-2010
Secretary/Treasurer – 2004-2006
American Finance Association
Financial Management Association

SPEAKING ENGAGEMENTS

"Leadership in the Financial Services Sector", Guest Professor – Cost of Capital, Business Leader Development Program, Rutgers University School of Business, February 20, 2015, Camden, NJ.

"ROE: Trends & Analysis", American Gas Association, AGA Mini-Forum for the Financial Analysts Community & Finance Committee Meeting, September 11, 2014, The Princeton Club, New York, NY.

Guest Professor, "Measuring Risk", Asset Supervision and Administration Commission of the State Council of the Peoples' Republic of China, Rutgers School of Business, July 21, 2014, New Brunswick, NJ.

Instructor, "Cost of Capital 101", EPCOR Water America, Inc., Regulatory Management Team, June 9, 2014, Phoenix, AZ.

Moderator: Society of Utility Financial Analysts: 46th Financial Forum – "The Rating Agencies' Perspectives: Regulatory Mechanisms and the Regulatory Compact", April 22-25, 2014, Indianapolis, IN.

"The Return on Equity Debate: Its Impact on Budgeting and Investment and Wall Street's View of Risk", National Association of Water Companies – 2014 Indiana Chapter Water Summit, March 13, 2014, Indianapolis, IN.

"Regulatory Training in Financing, Planning, Strategies and Accounting Issues for Publicly- and Privately-Owned Water and Wastewater Utilities", New Mexico State University Center for Public Utilities, October 13-18, 2013, Instructor (Cost of Capital).

"Regulated Utilities – Access to Capital", (panelist) - Innovation: Changing the Future of Energy, 2013 Deloitte Energy Conference, Deloitte Center for Energy Solutions, May 22, 2013, Washington, DC.

"Comparative Evaluation of the Predictive Risk Premium Model, the Discounted Cash Flow Model and the Capital Asset Pricing Model for Estimating the Cost of Common Equity", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) – Advanced Workshop in Regulation and Competition, 32nd Annual Eastern Conference of the Center for Research in Regulated Industries (CRRI), May 17, 2013, Rutgers University, Shawnee on the Delaware, PA.

"Decoupling: Impact on the Risk and Cost of Common Equity of Public Utility Stocks", before the Society of Utility and Regulatory Financial Analysts: 45th Financial Forum, April 17-18, 2013, Indianapolis, IN.

"Issues Surrounding the Determination of the Allowed Rate of Return", before the Staff Subcommittee on Electricity of the National Association of Regulatory Utility Commissioners, Winter 2013 Committee Meetings, February 3, 2013, Washington, DC.

"Leadership in the Financial Services Sector", Guest Professor – Cost of Capital, Business Leader Development Program, Rutgers University School of Business, February 1, 2013, Camden, NJ.

"Analyst Training in the Power and Gas Sectors", SNL Center for Financial Education, Downtown Conference Center at Pace University, New York City, December 12, 2012, Instructor (Financial Statement Analysis).

"Regulatory Training in Financing Planning, Strategies and Accounting Issues for Publicly and Privately Owned Water and Wastewater Utilities", New Mexico State University Center for Public Utilities, October 14-19, 2012, Instructor (Cost of Financial Capital).

"Application of a New Risk Premium Model for Estimating the Cost of Common Equity", Co-Presenter with Dylan W. D'Ascendis, CRRA, AUS Consultants, Edison Electric Institute Cost of Capital Working Group, October 3, 2012, Webinar.

"Application of a New Risk Premium Model for Estimating the Cost of Common Equity", Co-Presenter with Dylan W. D'Ascendis, CRRA, AUS Consultants, Staff Subcommittee on Accounting and Finance of the National Association of Regulatory Commissioners, September 10, 2012, St. Paul, MN.

"Analyst Training in the Power and Gas Sectors", SNL Center for Financial Education, Downtown Conference Center at Pace University, New York City, August 7, 2012, Instructor (Financial Statement Analysis).

"Advanced Regulatory Training in Financing Planning, Strategies and Accounting Issues for Publicly and Privately Owned Water and Wastewater Utilities", New Mexico State University Center for Public Utilities, May 13-17, 2012, Instructor (Cost of Financial Capital).

"A New Approach for Estimating the Equity Risk Premium Applied to Public Utilities", before the Finance and Regulatory Committees of the National Association of Water Companies, March 29, 2012, Telephonic Conference.

"A New Approach for Estimating the Equity Risk Premium Applied to Public Utilities", (co-presenter with Frank J. Hanley, Principal and Director, AUS Consultants) before the Water Committee of the National Association of Regulatory Utility Commissioners' Winter Committee Meetings, February 7, 2012, Washington, DC.

"A New Approach for Estimating the Equity Risk Premium Applied to Public Utilities", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University and Frank J. Hanley, Principal and Director, AUS Consultants) before the Wall Street Utility Group, December 19, 2011, New York City, NY.

"Advanced Cost and Finance Issues for Water", (co-presenter with Gary D. Shambaugh, Principal & Director, AUS Consultants), 2011 Advanced Regulatory Studies Program – Ratemaking, Accounting and Economics, September 29, 2011, Kellogg Center at Michigan State University – Institute for Public Utilities, East Lansing, MI.

"Public Utility Betas and the Cost of Capital", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) – Advanced Workshop in Regulation and Competition, 30th Annual Eastern Conference of the Center for Research in Regulated Industries (CRRI), May 20, 2011, Rutgers University, Skytop, PA.

Moderator: Society of Utility and Regulatory Financial Analysts: 43rd Financial Forum – "Impact of Cost Recovery Mechanisms on the Perception of Public Utility Risk", April 14-15, 2011, Washington, DC.

"A New Approach for Estimating the Equity Risk Premium for Public Utilities", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) – Hot Topic Hotline Webinar, December 3, 2010, Financial Research Institute of the University of Missouri.

"A New Approach for Estimating the Equity Risk Premium for Public Utilities", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) before the Indiana Utility Regulatory Commission Cost of Capital Task Force, September 28, 2010, Indianapolis, IN.

Tomorrow's Cost of Capital: Cost of Capital Issues 2010, Deloitte Center for Energy Solutions, 2010 Deloitte Energy Conference, "Changing the Great Game: Climate, Customers and Capital", June 7-8, 2010, Washington, DC.

"A New Approach for Estimating the Equity Risk Premium for Public Utilities", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) – Advanced Workshop in Regulation and Competition, 29th Annual Eastern Conference of the Center for Research in Regulated Industries (CRRI), May 20, 2010, Rutgers University, Skytop, PA.

Moderator: Society of Utility and Regulatory Financial Analysts: 42nd Financial Forum – "The Changing Economic and Capital Market Environment and the Utility Industry", April 29-30, 2010, Washington, DC.

"A New Model for Estimating the Equity Risk Premium for Public Utilities" (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) – Spring 2010 Meeting of the Staff Subcommittee on Accounting and Finance of the National Association of Regulatory Utility Commissioners, March 17, 2010, Charleston, SC.

"New Approach to Estimating the Cost of Common Equity Capital for Public Utilities" (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) - Advanced Workshop in Regulation and Competition, 28th Annual Eastern Conference of the Center for Research in Regulated Industries (CRRI), May 14, 2009, Rutgers University, Skytop, PA.

Moderator: Society of Utility and Regulatory Financial Analysts: 41st Financial Forum – "Estimating the Cost of Capital in Today's Economic and Capital Market Environment", April 16-17, 2009, Washington, DC.

"Water Utility Financing: Where Does All That Cash Come From?", AWWA Pre-Conference Workshop: Water Utility Ratemaking, March 25, 2008, Atlantic City, NJ.

PAPERS

"Comparative Evaluation of the Predictive Risk Premium ModelTM, the Discounted Cash Flow Model and the Capital Asset Pricing Model", co-authored with Richard A. Michelfelder, Ph.D., Rutgers University, Dylan W. D'Ascendis, and Frank J. Hanley, The Electricity Journal, May, 2013 (forthcoming).

"A New Approach for Estimating the Equity Risk Premium for Public Utilities", co-authored with Frank J. Hanley and Richard A. Michelfelder, Ph.D., Rutgers University, The Journal of Regulatory Economics (December 2011), 40:261-278.

"Comparable Earnings: New Life for Old Precept" co-authored with Frank J. Hanley, Financial Quarterly Review, (American Gas Association), Summer 1994.

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Arizona Corporation Commission				
Arizona Water Company	08/15	Arizona Water Company	W-01445A-15-0277	Return on Equity
EPCOR Water Arizona, Inc.	03/14	EPCOR Water Arizona, Inc.	WS-01303A-14-0010	Return on Equity
Arizona Water Company	04/12	Arizona Water Company - Eastern Group	W-01445A-11-0310	DSIC Mechanism - Credit Quality; Return on Equity
Chaparral City Water Company	04/13	Chaparral City Water Company	W-02113A-13-118	Return on Equity
Arizona Water Company	08/12	Arizona Water Company - Northern Group	W-01445A-12-0348	Return on Equity
Bermuda Water Co.	09/11	Bermuda Water Co.	W-01812A-10-0521	Return on Equity
Arkansas Public Service Commission				
United Water Arkansas, Inc.	03/10	United Water Arkansas, Inc.	09-130-U	Fair Rate of Return
United Water Arkansas, Inc.	12/06	United Water Arkansas, Inc.	06-160-U	Fair Rate of Return
United Water Arkansas, Inc.	09/03	United Water Arkansas, Inc.	03-161-U	Return on Equity
Arkansas Western Gas Company d/b/a Associated Natural Gas Company	02/97	Associated Natural Gas Company	97-019-U	Capital Structure
Arkansas Western Gas Company	02/97	ANG Division – Arkansas	97-019-I	Capital Structure
Arkansas Western Gas Company	02/96	ANG Division – Arkansas	GR-97-272	Return on Equity
Arkansas Eastern Gas Company	02/96	Arkansas Western Gas Company	96-030-U	Capital Structure
British Columbia Utilities Commission				
Corix Utilities, Inc.	07/13	Corix Utilities, Inc.	Generic Cost of Capital Proceeding- Phase II	Return on Equity
Corix Utilities, Inc.	08/12	Corix Utilities, Inc.	Generic Cost of Capital Proceeding – Phase I	Return on Equity
California Public Utilities Commission				
San Gabriel Valley Water Company	05/12	San Gabriel Valley Water Company	12-05-002	Return on Equity
San Jose Water Company	05/09	San Jose Water Company	U-168-W	Return on Equity
San Jose Water Company	05/11	San Jose Water Company	U-168-W	Return on Equity
Thames RWE re: California-American Water Co.	05/02	Thames RWE re: California-American Water Co.	02-01-036	Return on Equity
Connecticut Department of Public Utility Control				
Aquarion Water Co. of Connecticut	03/13	Aquarion Water Co. of Connecticut	13-02-30	Return on Equity
Connecticut Water Company	01/10	Connecticut Water Company	09-12-11	Return on Equity
Aquarion Water Company	03/10	Aquarion Water Company	10-02-13	Return on Equity

United Water Connecticut	09/10	United Water Connecticut	10-09-08	Fair Rate of Return
United Water Connecticut	05/07	United Water Connecticut	07-05-44	Fair Rate of Return
Delaware Public Service Commission				
Artesian Water Company	04/08	Artesian Water Company	08-96	Fair Rate of Return
Artesian Water Company	04/14	Artesian Water Company	14-132	Fair Rate of Return
Tidewater Utilities, Inc.	11/13	Tidewater Utilities, Inc.	13-466	Return on Equity
Tidewater Utilities, Inc.	09/11	Tidewater Utilities, Inc.	11-397	Fair Rate of Return
Artesian Water Company	04/11	Artesian Water Company	11-207	Fair Rate of Return
United Water Delaware, Inc.	12/10	United Water Delaware, Inc.	10-421	Fair Rate of Return
United Water Delaware, Inc.	02/09	United Water Delaware, Inc.	09-60	Fair Rate of Return
Tidewater Utilities, Inc.	01/09	Tidewater Utilities, Inc.	09-29	Fair Rate of Return
Sussex Shores Water Company	10/07	Sussex Shores Water Company	07-278	Fair Rate of Return
United Water Delaware, Inc.	05/06	United Water Delaware, Inc.	06-174	Fair Rate of Return
Tidewater Utilities, Inc.	04/06	Tidewater Utilities, Inc.	06-145	Fair Rate of Return
Tidewater Utilities, Inc.	04/04	Tidewater Utilities, Inc.	04-152	Fair Rate of Return
Tidewater Utilities, Inc.	01/02	Tidewater Utilities, Inc.	02-28	Fair Rate of Return
Sussex Shores Water Company	11/99	Sussex Shores Water Company	99-576	Fair Rate of Return
Tidewater Utilities, Inc.	9/99	Tidewater Utilities, Inc.	99-446	Fair Rate of Return
Long Neck Water Company	01/99	Long Neck Water Company	99-31	Overall Rate of Return
United Water Delaware, Inc.	03/98	United Water Delaware	98-98	Return on Equity
United Water Delaware, Inc.	08/96	United Water Delaware, Inc.	96-164	Capital Structure and Fixed Capital Cost Rates
Florida Public Service Commission				
Utilities Inc.	08/08	Utilities Inc.	080006-WS	Fair Rate of Return
Utilities, Inc. of Florida	06/03	Utilities, Inc. of Florida	020071-WS	Fair Rate of Return
Hawaiian Public Utilities Commission				
GTE Hawaiian Telephone	10/96	GTE Hawaiian Telephone	95-0054	Common Equity Cost, Capital Structure and Storm Damage Cost Recovery
GTE Hawaiian Telephone	06/96	GTE Hawaiian Telephone	95-0051/94-0298	Self-Insurance Property Damage Reserve-Ratepayer Responsibility
Idaho Public Utility Commission				
United Water Idaho, Inc.	05/15	United Water Idaho, Inc.	UWI-W-15-01	State Property Tax Study
United Water Idaho, Inc.	08/11	United Water Idaho, Inc.	UWI-W-11-02	Fair Rate of Return

United Water Idaho, Inc.	11/04	United Water Idaho, Inc.	UWI-W-04-04	Fair Rate of Return
Illinois Commerce Commission				
Illinois-American Water Company	10/11	Illinois-American Water Company	11-0767	Return on Equity
Apple Canyon Utility Co. / Lake Wildwood Utilities Corp.	04/10	Apple Canyon Utility Co. / Lake Wildwood Utilities Corp.	09-0548/0549	Fair Rate of Return
Illinois American Water Company	05/09	Illinois American Water Company	09-0319	Return on Equity
Illinois-American Water Company	08/07	Illinois-American Water Company	07-0507	Return on Equity
Aqua Illinois, Inc.	02/06	Aqua Illinois, Inc. - Kankakee Water Division	06-0285	Return on Equity
Aqua Illinois	12/04	Aqua Illinois - Woodhaven Water & Sewer Divisions	05-0071	Return on Equity
Aqua Illinois	12/04	Aqua Illinois - Oak Run Water & Sewer Divisions	05-0072	Return on Equity
United Water Idaho, Inc.	11/04	United Water Idaho, Inc.	UWI-W-04-04	Fair Rate of Return
Aqua Illinois	05/04	Aqua Illinois - Vermillion Water Division	04-0442	Return on Equity
Aqua Illinois (formerly Consumers Ill. Water Co.)	05/03	Aqua Illinois (formerly Consumers Ill. Water Co.)	03-0403	Fair Rate of Return
Aqua Illinois (formerly Consumers Ill. Water Co.)	04/00	Aqua Illinois (formerly Consumers Ill. Water Co.)	00-0337, 00-0338, 00-0339	Return on Equity
Indiana Utility Regulatory Commission				
Indiana-American Water Company	01/14	Indiana-American Water Company	44450	Return on Equity
Pioneer Water LLC	10/13	Pioneer Water LLC	4434	Return on Equity
Utility Center, Inc.	03/10	Utility Center, Inc.	43874	Fair Rate of Return
Twin Lakes Utilities, Inc.	11/06	Twin Lakes Utilities, Inc.	43128	Fair Rate of Return
Utility Center, Inc.	08/07	Utility Center, Inc.	43331	Fair Rate of Return
Twin Lakes Utilities, Inc.	09/03	Twin Lakes Utilities, Inc.	42488	Fair Rate of Return
United Water West Lafayette, Inc.	01/97	United Water West Lafayette, Inc.	41046	Return on Equity
United Water Indiana, Inc.	01/97	United Water Indiana, Inc.	41047	Return on Equity
Iowa Utilities Board				
Iowa-American Water Company	04/11	Iowa-American Water Company	RPU-2011-0001	Return on Equity
Iowa-American Water Company	04/09	Iowa-American Water Company	RPU-2009-0004	Return on Equity
Iowa-American Water Company	08/07	Iowa-American Water Company	RPU-2007-0003	Return on Equity
Kentucky Public Service Commission				
Water Service Corp. of Kentucky	01/09	Water Service Corp. of Kentucky	2008-00563	Fair Rate of Return
Water Service Corp. of Kentucky	08/05	Water Service Corp. of Kentucky	2005-00325	Fair Rate of Return

Louisiana Public Service Commission				
Louisiana Water Service, Inc.	03/08	Louisiana Water Service, Inc.	U-30553	Fair Rate of Return
Maine Public Service Commission				
Maine Water Company	12/13	Maine Water Company – Camden & Rockland Division	2013-00362	Return on Equity
Consumers Maine Water Company	05/00	Consumers Maine Water Company	2000-96 & 2000-175	Return on Equity
Maryland Public Service Commission				
Greenridge Utilities, Inc.	05/03	Greenridge Utilities, Inc.	8962	Fair Rate of Return
Michigan Public Service Commission				
Alpena Power Company	05/09	Alpena Power Company	U-15935	Fair Rate of Return
Alpena Power Company	04/07	Alpena Power Company	U-15250	Fair Rate of Return
Alpena Power Company	07/99	Alpena Power Company	U-12000	Return on Equity
Missouri Public Service Commission				
Missouri Gas Energy	09/13	Missouri Gas Energy	GR-2014-0007	Return on Equity
Missouri-American Water Company	06/11	Missouri-American Water Company	WR-2011-0337 / SR-2011-0338	Fair Rate of Return
Missouri-American Water Company	10/09	Missouri-American Water Company	WR-2010-0131	Return on Equity
Missouri American Water Company	03/08	Missouri American Water Company	WR-2008-0311 / SR-2008-0312	Return on Equity
Missouri American Water Company	12/06	Missouri American Water Company	WR-2007-0216 / WR-2007-0217	Return on Equity
Missouri-American Water Company	05/03	Missouri-American Water Company	WR-2003-0500 & WC-2004-0168	Fair Rate of Return
Arkansas Western Gas Company	02/97	ANG Division – Missouri	GR-97-272	Capital Structure
New Hampshire Public Utilities Commission				
Aquarion Water Co. of New Hampshire, Inc.	03/13	Aquarion Water Co. of New Hampshire, Inc.	DW 12-085	Return on Equity
New Jersey Board of Public Utilities				
United Water New Jersey, Inc.	10/15	United Water New Jersey, Inc.	WR-15101177	Return on Equity
United Water Toms River, Inc.	02/15	United Water Toms River, Inc.	W-01303A-14-0010	Return on Equity
Atlantic City Sewerage Company	10/14	Atlantic City Sewerage Company	WR-14101263	Return on Equity
Aqua New Jersey, Inc.	01/14	Aqua New Jersey, Inc.	WR-14010019	Fair Rate of Return
Middlesex Water Company	11/13	Middlesex Water Company	WR-13111059	Return on Equity
United Water New Jersey, Inc.	03/13	United Water New Jersey, Inc.	WR-13030210	Fair Rate of Return
Jersey Central Power & Light Company	11/12	Jersey Central Power & Light Company	ER-12111052	Return on Equity

United Water Toms River, Inc.	09/12	United Water Toms River, Inc.	WR-12090830	Fair Rate of Return
Pinelands Water Company	08/12	Pinelands Water Company	WR-12080735	Return on Equity
Pinelands Wastewater Company	08/12	Pinelands Wastewater Company	WR-12080734	Return on Equity
Middlesex Water Company	01/12	Middlesex Water Company	WR-12010027 / PUC 1653-2012	Fair Rate of Return
Aqua New Jersey, Inc.	12/11	Aqua New Jersey, Inc.	WR 11120859	Fair Rate of Return
The New Jersey Utilities Association	10/11	The New Jersey Utilities Association	PUC 07146-09 (OAL) / WO-090148 (BPU)	Return on Equity
United Water New Jersey, Inc.	07/11	United Water New Jersey, Inc.	WR-11070428	Fair Rate of Return
The Atlantic City Sewerage Company	04/11	The Atlantic City Sewerage Company	WR-11040247	Fair Rate of Return
United Water Great Gorge, Inc./United Water Vernon Sewerage, Inc.	10/10	United Water Great Gorge, Inc./United Water Vernon Sewerage, Inc.	WR-10100785	Fair Rate of Return
United Water New Jersey, Inc.	12/09	United Water New Jersey, Inc.	WR-09120987	Fair Rate of Return
Aqua New Jersey, Inc.	12/09	Aqua New Jersey, Inc.	WR-09121005	Fair Rate of Return
The Atlantic City Sewerage Company	11/09	The Atlantic City Sewerage Company	WR-09110940	Fair Rate of Return
United Water Toms River, Inc.	11/09	United Water Toms River, Inc.	WR-09110934	Fair Rate of Return
Middlesex Water Company	08/09	Middlesex Water Company	WR-0908066	Fair Rate of Return
United Water New Jersey, Inc.	09/08	United Water New Jersey, Inc.	WR-08090710	Fair Rate of Return
United Water West Milford, Inc.	09/08	United Water West Milford, Inc.	WR-08100928	Fair Rate of Return
United Water Arlington Hills, Inc.	09/08	United Water Arlington Hills, Inc.	WR-08100929	Fair Rate of Return
Applied Wastewater Management	08/08	Applied Wastewater Management	WR-08080550	Fair Rate of Return
Middlesex Water Company	04/08	Pinelands Water Company	WR-08040282	Return on Equity
United Water Toms River, Inc.	03/08	United Water Toms River, Inc.	R-WR-08030139	Fair Rate of Return
Aqua New Jersey, Inc.	12/07	Aqua New Jersey, Inc.	WR-07120955	Fair Rate of Return
The Atlantic City Sewerage Company	11/07	The Atlantic City Sewerage Company	WR-0007110866	Fair Rate of Return
Middlesex Water Company	04/07	Middlesex Water Company	PUCRL 05663-2007N	Fair Rate of Return
United Water New Jersey, Inc.	02/07	United Water New Jersey, Inc.	WR-07020135	Fair Rate of Return
Aqua New Jersey, Inc.	12/05	Aqua New Jersey, Inc.	WR-05121022	Fair Rate of Return
Pinelands Water Company	08/05	Pinelands Water Company	WR-05080681	Return on Equity
Pinelands Wastewater Company	08/05	Pinelands Wastewater Company	WR-05080680	Return on Equity
Middlesex Water Company	05/05	Middlesex Water Company	WR-05050451	Fair Rate of Return
Pinelands Wastewater Company	12/03	Pinelands Wastewater Company	WR-031201017	Return on Equity

Pinelands Water Company	12/03	Pinelands Water Company	WR-031201016	Return on Equity
Aqua New Jersey, Inc. (formerly Consumers New Jersey Water Co.)	12/03	Aqua New Jersey, Inc. (formerly Consumers New Jersey Water Co.)	WR-03120974	Return on Equity
Middlesex Water Company	11/03	Middlesex Water Company	WR-03110900	Fair Rate of Return
Mount Holly Water Company	07/03	Mount Holly Water Company	WR-03070509 & OAL PUCRL 07280-2003N	Fair Rate of Return
Elizabethtown Water Company	07/03	Elizabethtown Water Company	WR-03070510 & OAL PUCRL 07281-2003N	Return on Equity
New Jersey-American Water Company	04/03	New Jersey-American Water Company	WR-03070511 & OAL PUCRL 07279-2003N	Fair Rate of Return
Thames RWE re: New Jersey-American Water Co.	08/02	Thames RWE re: New Jersey-American Water Co.	WM-01120833	Return on Equity
Aqua New Jersey, Inc. (formerly Consumers New Jersey Water Co.)	03/02	Aqua New Jersey, Inc. (formerly Consumers New Jersey Water Co.)	WR-02030133	Return on Equity
Elizabethtown Water Company	04/01	Elizabethtown Water Company	WR-01040205	Overall Fair Rate of Return
Middlesex Water Company	06/00	Middlesex Water Company	WR-00060362	Fair Rate of Return
Aqua New Jersey, Inc. (formerly Consumers New Jersey Water Co.)	03/00	Aqua New Jersey, Inc. (formerly Consumers New Jersey Water Co.)	WR-00030174 & OAL PUCRS04524-00S	Return on Equity
Middlesex Water Company	09/98	Middlesex Water Company	98-090795	Fair Rate of Return
Middlesex Water Company	11/96	Middlesex Water Company	96-110818	Return on Equity
New York State Public Service Commission				
United Water New Rochelle, Inc. / United Water West Chester, Inc.	11/13	United Water New Rochelle, Inc. / United Water West Chester, Inc.	13-W-0539/13-W-564	Return on Equity
United Water New York, Inc.	07/13	United Water New York, Inc.	13-W-0295	Fair Rate of Return
Long Island American Water Company d/b/a Long Island American Water for Water Service	05/11	Long Island American Water Company	11-W-0200	Return on Equity
United Water Owego-Nichols, Inc.	02/11	United Water Owego-Nichols, Inc.	11-W-0082	Fair Rate of Return
United Water Westchester, Inc.	11/09	United Water Westchester, Inc.	09-W-0828	Fair Rate of Return
United Water New Rochelle Inc.	11/09	United Water New Rochelle Inc.	09-W-0824	Fair Rate of Return
United Water New York, Inc.	09/09	United Water New York, Inc.	09-W-0731	Fair Rate of Return
United Water Owego/Nichols, Inc.	05/07	United Water Owego/Nichols, Inc.	07-W-0639 / 07-W0872	Fair Rate of Return
United Water New York, Inc. / South County	01/06	United Water New York, Inc.	Cases 06-W-0131 and 06-W-0244	Fair Rate of Return
United Water New Rochelle, Inc.	09/04	United Water New Rochelle, Inc.	04-W-1221	Fair Rate of Return
North Carolina Utility Commission				
Carolina Water Service of North	08/15	Carolina Water Company of North	W-354, Sub 344	Return on Equity

Carolina		Carolina		
Aqua North Carolina, Inc.	12/13	Aqua North Carolina, Inc.	W-218, Sub 363	Fair Rate of Return
Carolina Water Service, Inc. of NC.	10/13	Carolina Water Service, Inc. of NC.	W-354 Sub 336	Fair Rate of Return
Pluris, LLC	08/12	Pluris, LLC	W-1282, Sub 8	Return on Equity
Aqua North Carolina, Inc.	05/11	Aqua North Carolina, Inc.	W-218, Sub 319	Fair Rate of Return
Carolina Water Service, Inc. of NC	10/10	Carolina Water Service, Inc. of NC	W-354. Sub 324	Fair Rate of Return
Carolina Water Service, Inc. of NC	10/10	Carolina Water Service, Inc. of NC - Ops. in Currituck Co.	W-354. Sub 327	Fair Rate of Return
Transylvania Utilities, Inc.	05/06	Transylvania Utilities, Inc.	W-1012, Sub 7	Fair Rate of Return
Carolina Pines Utilities, Inc.	04/04	Carolina Pines Utilities, Inc.	W-1151	Return on Equity
Transylvania Utilities, Inc.	04/04	Transylvania Utilities, Inc.	W-1012, Sub 5	Return on Equity
Nero Utilities, Inc.	04/04	Nero Utilities, Inc.	W-1152	Return on Equity
Pennsylvania Public Utility Commission				
United Water Pennsylvania Inc.	01/15	United Water Pennsylvania Inc.	R-2015-2462523	Return on Equity
Penn Estates Utilities, Inc.	12/11	Penn Estates Utilities, Inc.	R-2011-2255159	Return on Equity
United Water Pennsylvania, Inc.	05/11	United Water Pennsylvania, Inc.	R-2011-2232985	Fair Rate of Return
United Water Pennsylvania, Inc.	09/09	United Water Pennsylvania, Inc.	R-2009-2122887	Fair Rate of Return
Penn Estates Utilities, Inc. (Water) / (Sewer)	09/09	Penn Estates Utilities, Inc. (Water) / (Sewer)	R-2009-2117532 / R-2009-2117400	Fair Rate of Return
Utilities, Inc. - Westgate	09/09	Utilities, Inc. - Westgate	R-2009-2117389	Fair Rate of Return
Utilities, Inc. of Pennsylvania	09/09	Utilities, Inc. of Pennsylvania	R-2009-2117402	Fair Rate of Return
Trigen-Philadelphia Energy Corp.	06/09	Trigen-Philadelphia Energy Corp.	R-2009-2111011	Fair Rate of Return
The Columbia Water Company	12/08	The Columbia Water Company	R-2008-2045157	Return on Equity
The Newtown Artesian Water Company	11/08	The Newtown Artesian Water Company	R-2008-2042293	Fair Rate of Return
NRG Energy Center Harrisburg	03/08	NRG Energy Center Harrisburg	R-2008-2028395	Fair Rate of Return
Total Environmental Solutions, Inc. - Treasure Lake Water Division	02/08	Total Environmental Solutions, Inc. - Treasure Lake Water Division	R-00072493	Fair Rate of Return
Total Environmental Solutions, Inc. - Treasure Lake Sewer Division	02/08	Total Environmental Solutions, Inc. - Treasure Lake Sewer Division	R-00072495	Fair Rate of Return
Emporium Water Company	06/06	Emporium Water Company	R-00061297	Fair Rate of Return
NRG Energy Center Pittsburgh	06/06	NRG Energy Center Pittsburgh	R-00061435	Fair Rate of Return
City of DuBois, PA	04/06	City of DuBois, PA	R-00050671	Fair Rate of Return
United Water Pennsylvania, Inc.	01/06	United Water Pennsylvania, Inc.	R-00051186	Fair Rate of Return
Valley Energy, Inc.	10/04	Valley Energy, Inc.	R-00049345	Fair Rate of Return
Borough of Hanover	08/02	Borough of Hanover	R-00027522	Fair Rate of Return

Audubon Water Company	04/02	Audubon Water Company	R-00027104	Fair Rate of Return
Wellsboro Electric Company	10/01	Wellsboro Electric Company	R-00016356	Fair Rate of Return
Emporium Water Company	09/00	Emporium Water Company	R-00005050	Fair Rate of Return
Penn Estates Utilities, Inc.	01/00	Penn Estates Utilities, Inc.	R-00005031 & R-00005032	Fair Rate of Return
Pittsburgh Thermal, L.P.	11/99	Pittsburgh Thermal, L.P.	R-00994641	Fair Rate of Return
PG Energy	03/98	PG Energy	R-009880	Capital Structure and Embedded Fixed Capital Cost Rates
Western Utilities, Inc.	08/97	Western Utilities, Inc.	R-00963856	Fair Rate of Return
PG Energy	05/96	PG Energy	R-0096312	Capital Structure and Embedded Fixed Capital Cost Rates
Public Service Commission of Nevada				
Utilities Inc. of Central Nevada	12/09	Utilities Inc. of Central Nevada	09-12017	Fair Rate of Return
Utilities Inc., of Nevada	06/09	Utilities Inc., of Nevada	09-06037	Fair Rate of Return
Spring Creek Utilities, Inc.	06/08	Spring Creek Utilities, Inc.	08-06036	Fair Rate of Return
Utilities, Inc. of Central Nevada	12/06	Utilities, Inc. of Central Nevada	06-12023	Fair Rate of Return
Spring Creek Utilities, Inc.	04/06	Spring Creek Utilities, Inc.	06-01002	Fair Rate of Return
Public Service Commission of South Carolina				
United Utility Companies, Inc.	09/13	United Utility Companies, Inc.	2013-199-WS	Capital Structure
Utilities Services of South Carolina	09/13	Utilities Services of South Carolina	2013-201-WS	Capital Structure
Tega Cay Water Services Inc.	12/12	Tega Cay Water Services Inc.	2012-177-WS	Fair Rate of Return
Carolina Water Service, Inc.	08/11	Carolina Water Service, Inc.	2011-47-WS	Fair Rate of Return
Tega Cay Water Service, Inc.	04/10	Tega Cay Water Service, Inc.	2009-473-WS	Fair Rate of Return
United Utility Companies, Inc.	02/10	United Utility Companies, Inc.	2009-479-W/S	Fair Rate of Return
Utilities Services of South Carolina	11/07	Utilities Services of South Carolina	2007-286-WS	Fair Rate of Return
Southland Utilities, Inc.	09/07	Southland Utilities, Inc.	2007-244-W	Fair Rate of Return
Tega Cay Water Service, Inc.	07/06	Tega Cay Water Service, Inc.	2006-97-WS	Return on Equity
United Utility Companies, Inc.	07/06	United Utility Companies, Inc.	2006-107-W/S	Fair Rate of Return
Carolina Water Service, Inc.	06/06	Carolina Water Service, Inc.	2006-92-W/S	Fair Rate of Return
Utilities Services of South Carolina	11/05	Utilities Services of South Carolina	2005-217-WS	Fair Rate of Return
Carolina Water Service of South Carolina	04/05	Carolina Water Service of South Carolina	2004-357-W/S	Fair Rate of Return
United Utility Companies	01/02	United Utility Companies	2000-0210-W/S	Fair Rate of Return
Carolina Water Service of South	06/01	Carolina Water Service of South	2000-0207-W/S	Fair Rate of Return

Carolina		Carolina		
Public Utility Commission of Ohio				
Aqua Ohio, Inc.	12/13	Aqua Ohio, Inc.	13-2124-WW-AIR	Return on Equity
Ohio American Water Company	8/12	Ohio American Water Company	11-4161-WS-AIR	Fair Rate of Return
Ohio American Water Company	6/09	Ohio American Water Company	09-391-WS-AIR	Fair Rate of Return
Ohio American Water Company	10/06	Ohio American Water Company	06-433-WS-AIR	Fair Rate of Return
Ohio-American Water Company	11/04	Ohio-American Water Company	03-2390-WS-AIR	Return on Equity
Regulatory Commission of Alaska				
Fairbanks Natural Gas, LLC	6/14	Fairbanks Natural Gas, LLC	U-14-102	Fair Rate of Return
Rhode Island Public Utilities Commission				
United Water Rhode Island, Inc.	8/13	United Water Rhode Island, Inc.	4434	Fair Rate of Return
United Water Rhode Island, Inc.	6/11	United Water Rhode Island, Inc.	4255	Fair Rate of Return
Virginia State Corporation Commission				
Aqua Virginia, Inc.	8/14	Aqua Virginia, Inc.	PUE-2014-00045	Return on Equity
Massanutten Public Service Corporation	9/09	Massanutten Public Service Corporation	PUE-2009-00041	Return on Equity
Land'Or Utility Company	12/06	Land'Or Utility Company	PUE-2006-00128	Return on Equity
Massanutten Public Service Corporation	12/06	Massanutten Public Service Corporation	PUE-2006-00126	Return on Equity
Reston Lake Anne Air Conditioning Corp.	5/12	Reston Lake Anne Air Conditioning Corp.	PUE-2011-00130	Return on Equity
Aqua Virginia, Inc.	10/11	Aqua Virginia, Inc. (Monticello)	PUE-2005-00080	Return on Equity
Aqua Virginia, Inc.	10/11	Aqua Virginia, Inc. - Sydnor Hydrodynamics, Inc.	PUE-2011-00099	Return on Equity
United Water Virginia, Inc.	10/97	United Water Virginia, Inc.	PUE-2097-0544	Fair Rate of Return
Washington Utilities & Transportation Commission				
Washington Natural Gas Company	03/95	Washington Natural Gas Company	UG-950278	Capital Structure Ratios - Fixed Capital Cost Rates